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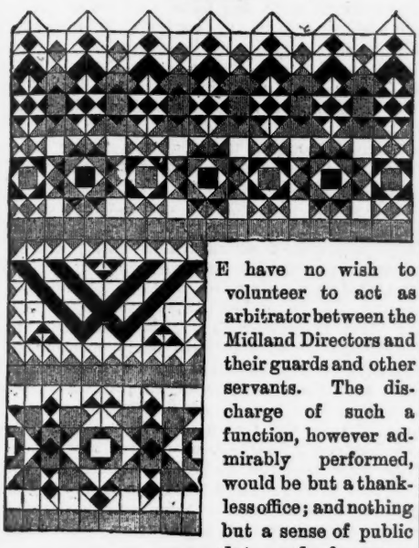
The Serious Contention on the Midland Railway.



WE have no wish to volunteer to act as arbitrator between the Midland Directors and their guards and other servants. The discharge of such a function, however admirably performed, would be but a thankless office; and nothing but a sense of public duty, and of possessing the confidence of both the opposing parties, could induce any competent man to consent to make such an effort. At the same time we question whether, unless such a step be opportunely taken, there is not too much reason to fear that discussion arising out of the contention will have to take place before other tribunals.

It is, however, impossible to remain silent on a subject of such grave national importance; and it is the more incumbent on us to offer a few remarks, because otherwise the very distinctly expressed views of the *Builder* as to short time may be appealed to in proof of the assertion that our judgment is entirely against the men in this case. This would be unjust, both to them and to ourselves.

The opinion enounced in these columns as to the hours of labour has been lately expressed on economic grounds. Thus regarded, we hold it to be absolutely incontrovertible that a reduction in the hours during which a factory, or any combination of men and machinery, works in the week or in the year, involves a diminution of production, that is to say, of national wealth, in proportion to the stoppage, and an increase of the cost of production, in the ratio of the loss of the machine power involved. As to that, there can be no dispute. There may be difference of opinion as to the policy; there can be none as to the facts. And no inquiry can be anything but a sham that ignores this primary truth.

This view of the case, it is hardly necessary to remark, does not apply to a railway. The railway system of Great Britain is an immense combination of machinery, directed and aided by human power, that never rests. To run the 220 millions of train miles that carried the traffic of 1877, a train must start, on each line, on an average about every half-hour. At all events, Mr. Fleming's estimate for 1876 (in No. 2 of his Index to our Railway System) gave thirty-two minutes for the average interval between trains starting in England, and thirty-seven for the United Kingdom, for a train mileage under 216,000,000 miles. These distances, of course, are not equally divided through the twenty-four hours. On the Metropolitan lines, for example, there are 5½ hours of rest from the passenger traffic, which have to be taken into account in speaking of intervals of eight and of five minutes between the trains. On many lines the passenger traffic is chiefly conducted by day, and the goods traffic by night. But this is by no means always the case. The night mail trains have always been the favourites of men of business. Over the whole great network of 15,000 miles of British railway, a constant, unintermitting, rapid stream of traffic flows continually day and night. Like the blood in the human body, the volume of the flow differs materially in different parts of the system. Unlike the blood, the flow is intermittent, and has a horary as well as a local maximum and minimum. But it never ceases. Nor is it possible to put a finger on any part of the system, and rudely to arrest the normal flow at a single point, without causing complication and danger to the whole,—danger the locality of which it is impossible to predict.

The first requisite, therefore, for the profitable employment of machinery is not present in the railway system of Great Britain. The fact is due to the mode in which that system has been allowed to develope itself,—not according to the convenience of individuals or the resolutions of trade societies, but as guided by the simple and continued effort how best to do the work. Probably not an hour of nightwork has been occupied, as a rule, by anything that could, under existing arrangements, have been as conveniently done by day. Great hardships have been borne, and are borne, by the officers of this great system, from the manager to the porter. But how best to carry the traffic has been the main care. And with many of those failings, which are due either to the limited strength, or to the limited intelligence, of all human organisations, there is no doubt that the great vital circulation is carried on, at this moment, with a punctuality and a care to which the world has never seen any parallel.

The economical difficulty, then, of fixing the hours for which machinery is to run does not arise in the case of the railways of Great Britain. The machine works continuously. The objections which apply to short time on the part of the workmen, when they imply stoppage of machinery, do not apply here. The only question is as to the best distribution of the human labour needed to keep the great machine in order.

As to this, when we come down from the limit of the managers of departments and high officials, the occupation of whose time is pretty much the same in any department of industry, we find two natural classes into which the occupation of a railway servant is divided. There are definite or intermittent duties, and there are continuous duties. A driver who has to take a train for a certain number of miles has a definite duty to perform, and his hours of labour can be so arranged as to come within the limit of health and strength. At a signal-box, where various streams of traffic meet, the duty is continuous. In the former case, the old limit of the ten hours' day, which has never been departed from on our railways, may in most cases, and ought in all, to be ample. In the latter case, it is no less clear that twelve hours' constant strain is too much for any one who should satisfactorily perform such onerous duties. Signalmen, and those who perform similar duties, ought not, in our opinion, to work for more than eight hours; and three shifts of men ought to be provided for the day's work.

It is undeniable that a very heavy responsibility is incurred by any person who rashly tampers with a great organisation of this kind for pecuniary profit. It is not for us to say that such a thing is unjustifiable. But we wish to point out certain considerations which, as it seems to us, are of great weight. In the present case the Midland directors have put the case in the very baldest and strongest form. "The state of trade and the condition of the labour market," says Mr. Allport, "call for a reduction of wages." What does that mean? Does it mean that the traffic of the Midland railway has so fallen off that the servants of the company really have less work to perform than they had a year ago, and, therefore, ought in future to take five per cent. less wages? No such thing. No such decline in amount of work is stated. Does it mean that, although the Midland keeps up its trade, other lines have suffered so much that they have had to discharge their servants, and that there is a surplus quantity of practised railway labour in the market? So far is this from being the case that the Midland Company are only the pioneers in a movement which other companies, and the servants of other companies, look on as a vast, a costly, and a dangerous experiment. All that can be meant by the "condition of the labour market" is, that there are so many men out of work, that any number of inexperienced hands may be ready to discharge the work of certain railway servants at a shilling a week lower wages! The manager, in fact, says,—"So-and-so, you have been at work for us for seven years. You have given satisfaction. You have been paid less than other men, for equal work, because of the steady, permanent character of your occupation. But Smith, who was not a railway man, but something else, will try his hand at your work for 17s. a week instead of 18s. Will you take 17s., or go about your business?"

That is, purely and simply, Mr. Allport's case as to reduction of wages. As to the trip system we shall have a word also to say. But even as to this, the question is complicated by a demand for sixty-six hours' work instead of sixty, which is in fact a reduction of wages. Now we shall be laughed out of court by a certain school if we speak of the bond that ought to exist between master and servant. We shall be told that these are old-fashioned sentimental notions, and that the Midland Rail-

way Company is a great trading company, bound, by duty to its proprietors, to make every shilling go as far as possible, and not to give 18s. for work that can be done for 17s.

But even on this narrow view of the case, is it certain that the policy is wise? As to its justice, on the higher ground of appreciation, we are told that it is no concern of ours. Will Mr. Allport get his 18s. worth of work for 17s.? We much question whether those who propose to do so do not forget the immense amount of human nature that exists in man. We are prepared to admit that the adoption of purely selfish rules might produce the best monetary result, provided men were universally and intelligently selfish. But, in point of fact, selfishness, the purer, that is to say, the more theoretically perfect, it is, is often the more narrow and short-sighted. If the Midland experiment is carried out to the end it will be an instructive instance of the working value of the so-called political economic theory.

Let us suppose the new tariff of wages triumphantly established. What will be the result? The servants of the Midland Company, of a certain grade, will all have been changed, in one way or in another. Either they will be new men, who have to learn the special duties of their position; or they will be the old men, smarting under a sense (rightly or wrongly entertained) of injury, and looking forward to a time when they may at least regain what they have lost. How can any man who knows human nature suppose that either of these two classes of men would render the same amount of cheerful, prompt, efficient service that each man performed before the reform?

We think otherwise. And we think that all experience shows that the difference between the labour of the discontented man, and that of the man who feels that, come what may, his employer seeks to regulate his relations with him, not by pettifogging sharpness, but by broad and liberal integrity and equity, will be something far more than five per cent. on the amount of work actually done. We lately spoke of a man's work as equivalent to 128 foot-tons per day. But that was willing work. Unquestionably, had pay been reduced, and had the services of a driving ganger been employed in exchange for those of an intelligent foreman, who had his master's interest at heart, the daily work in question would not have amounted to 100 foot-tons per man. Those who know what labour is, by working among and with the men, will know that this view is correct.

Let it not be said that we are putting this in the men's heads. What have they said at their meetings, temperate and orderly as they seem to have been? They have said that they deeply felt the injustice of the case;—that it was the worst-paid servants of the company on whom the burden was laid; that had matters been in a bad way, from no fault of the management, and had a general reduction of five or ten per cent. from the 4,000*l.* a year of the manager downwards, been proposed, it would have been another thing. The experiment, it was felt, had been tried on the very men least able to resist reduction, as well as most keenly feeling the pinch. Let the measure succeed or no, the men will not forget that. It will require a very large annual saving in the item of wages to make up for the unconscious but incessant loss effected by the substitution of perfunctory for willing service.

Now as to the trip system. "Here," it may be said, "of course the directors are in the right. They may count on the consistent support of the *Builder*, the steady advocate of piece-work, wherever possible, as the best-paying all round. Paying by the trip is piece-work. It is not intended to reduce wages by this method; in fact, during,—it is not said how long,—the company have only saved 60*l.* by the change. But by interesting the goods guards in the punctuality of their trains we make human nature pull with us, and secure a tremendous gain of time."

Is this so certain? In the first place it seems to us that paying by the trip is not properly to be called piece-work. It is deficient in one element of that method of contract; and that one happens to be the vital element.

The essential nature of piece-work we take to be this:—Assuming that a certain amount of work is done by ordinary labour at a known cost, the price of such work is offered to the labourer, measured not by the time in which it is done, but by the work itself. Thus, if 100 foot-tons per diem is an average amount of work done, for which 2s. 6d. is paid, a foreman, or say a set of men, are offered 2s. 6d. for 100 foot-tons of work. These men, then, will probably turn out 128-foot tons per day instead of 100. They will do 28 per cent. more work under the inducement of more pay. For this the master will pay at the same rate for labour; while he will get 28 per cent. more out of his capital and machinery for nothing, or for comparatively nothing.

This method, of course, gives a clear gain to the stronger, more skilful, and more industrious workman over the weaker, less skilful, and idler workman. Even to the latter it offers advantages; but it offers them at a price he does not like to pay,—the price of doing his best. Thus as a rule the better men,—unfortunately the minority,—are all firm supporters of piece-work. The inferior men,—and it is not peculiar to the working-classes that these form the large majority,—are against it. This is the general state of the question.

Now, where is the gain to be made by the best man in the trip system? His time-book is given him. The immediate regulation of running speed is not in his hands, but in those of the engine-driver. But do what he will, he can make no advance on the regulated speed. He can make no gain, either for the company or for himself. At every four or five miles the train is liable to be stopped by imperative signal. It is ordered into sidings by signal. It must always be kept out of the way of the passenger trains; and heavy penalties are imposed if this is neglected. The police seems to be admirable; the control, exercised from head-quarters, absolute. How can the guard loiter, even if he be disposed? Thus, when the men indignantly deny the charge, it must be allowed that at least the *primâ facie* evidence is in their favour.

Let us not, however, depart from an impartial view of the facts. As to the theory, we speak with such authority as clothes us from the confidence of a very large number of specially-educated readers. We say without hesitation, that the great evil of short time, viz., the waste of the machine power of the country, does not apply in the case of railways, which are ever-running machines. We say that the essential virtue of the piece-work system, that of allowing the best man to make the most remunerative use of his time, does not apply to the trip system. How, then, as to the detailed facts?

As to these, we cannot do better than cite the words of a very respectable contemporary, who, without that special knowledge of work which should be found in the conductors of a professional journal, has taken much the same view of the present strife as ourselves. "It has been stated," says the *Standard*, of the 11th of June, "with a precision and unanimity that leave no doubt for there being some foundation for the charge, that the executive of the company have not been successful in inspiring the *employés* with profound reliance on every assertion they make." This is a mild way of stating a very significant charge. And what may be further said, without prejudicing any one, is this,—to verify or disprove the statements of the men as to individual loss of time, and as to difficulty in obtaining due payment for overtime, is comparatively easy. To verify or disprove general statements as to loss or gain to the company, or absence of hardship on the part of the men, is a task of great difficulty, only to be discharged by some one invested with full powers, not only of arbitration, but also of audit.

It seems to us, then, that, point after point, there is every reason to regret the line of action which the directors of the Midland Company have been counselled to adopt, and to express the hope that, with such grace as they may, they shall hasten to re-establish those good relations between the superintendents and the men, of which some very gratifying instances have come to light during the present struggle. The great revenue of the Midland Railway, for the year 1877, was a trifle over 120,000*l.* per week. When we hear of the blocked lines, and of the reduced number of passengers that leave London, it is not too much to suppose that a loss of from 7,000*l.* to 10,000*l.* or more per diem is incurred by every day of strife. What may be the result of the employment, on a large scale, of new and untried hands, we forbear to point out. Is the game, even if successful, worth the candle?

There is another point which bears on the strong feeling entertained by the men, that the portion of dividend which it is now sought to stop from their wages might much more certainly be decided by a modification of the peculiar and experimental policy of the Midland. We are not among those who have been great admirers of this policy, and as yet it has found no imitators among the great lines. The result of the figures of the last half-yearly report prepared us to expect something unpleasant, and we fear that the attention of the shareholders may be diverted by this ill-considered strike from certain points of vital interest to themselves. The men speak of the great outlay on unnecessary works. Perhaps they are not the best judges on that score. Still the matter has to be looked at. In the half-year ending June, 1878, the Midland Railway ran 89,747 miles of passenger trains more than in the corresponding half-year of 1877, with an increase of gross income from passengers, parcels, mails, &c., of only 1,397*l.*! Of goods and mineral train mileage, the extra distance run in 1878 was 244,306 train miles; the additional gross earnings being 33,497*l.*; of which 28,020*l.* was derived from the more than questionably remunerative price of carriage of minerals. These extra train miles have thus only earned about 3s. 1d. per passenger train mile, and about 2s. 9d. for goods and mineral train miles. The cost of running a train mile (taking the generally unsatisfactory mode of lumping the cost all round, though the goods trains are from twice to thrice the weight of the passenger trains), was 33·9 pence in 1876, according to Mr. Fleming. In 1877 we make it rather less, namely, 33·12 pence per train mile. Thus the large amount of extra traffic barely earned enough to cover its own cost out of pocket. The total paid-up capital of the Midland Railway on 31st December, 1876, was 59,406,987*l.* On 31st December, 1877, it had risen to 62,189,984*l.* At the half-yearly meeting on the 20th of August last it stood at 64,036,291*l.*, and a further creation of capital was sanctioned to the extent of 2,050,000*l.* Exclusive of this, the traffic of 1878 must provide dividend on 2,583,000*l.* of capital stock more than was required in 1877. Where are the 103,000*l* thus required to come from? The passenger traffic seems to be steadily deteriorating as a source of net income. We have given the difference of income, and of mileage, for the year. For the half-year ending with June, 1878, the movement was even more unsatisfactory. The chairman admitted a falling off of 85,000 first-class passengers in that half-year; and though there had been an increase of 210,030 third-class passengers, the financial result showed a loss of 6,426*l.* on this, the most lucrative part, of the railway income.

Facts of this nature, which we may be sure are not in any way coloured against the railway company, are enough to show that there is great cause for straining every nerve to maintain the dividend of the shareholders. That such should be done we are altogether in accord with the Midland directors. But the question is,—how is it to be done? by reduction of cost, or by careful and intelligent cultivation of remunerative traffic? How much can be effected by the first method is doubtful, and at all events limited. Coals are now at a low price. We have seen what is the calculation about labour. But, supposing, instead of the 60*l.* said to have been saved in the wages of guards by the trip-system, 60,000*l.* are struck off the pay-sheet! It is a drop in the bucket. 1,043,000*l.* are required, after all working expenses, amounting in 1877 to 3,361,699*l.* for the year, and all interest on guaranteed and preferential stock, amounting, last August, to 549,945*l.* for the half-year, have been paid, in order to keep up a 5 per cent. dividend. What we do see is a steady increase of capital, and a marked increase, for 1877, of unproductive traffic. It is rather by reverting to the old rules to which England owns her mercantile wealth; by counting the cost; by leaving risky and unremunerative business to whoever likes to take it; by the ascertaining with absolute certitude the net earning power of each class of business, in order to cultivate the lucrative, and to diminish the non-remunerative; and by binding all the staff of this great enterprise together in one firm circle of cheerful devotion to the interests of the company; than by attempting, even with a brief success, to give a tangible form to the doctrine of political economists as to the labour market, that the Midland Railway Company can continue to maintain the character of a well-ordered undertaking.

THE OLD MASTERS' DRAWINGS AT THE GROSVENOR.

THE more we have looked at the two collections of old drawings now to be seen in London the more we have felt inclined to regret the lavish manner in which treasures such as these have been simultaneously poured forth upon the public in such a quantity as to preclude any really profitable study of the whole, except on the part of persons who have unlimited time on their hands. To others, the wealth of material is simply embarrassing, for any purpose beyond merely walking round and looking in a voluptuously indolent spirit of enjoyment. This is all very well in its way, but there is so much to be really learned from studying the manner in which great artists have put their first thoughts upon paper,—so much in regard both to art in general and to the habits and methods of each particular artist,—that it is really a pity to find spread out before us an amount of work all of which we cannot possibly study in this considerate and profitable manner, and which there is yet little chance of seeing again for an unlimited period. Even if we take one exhibition alone, we feel that half the number of drawings, combined with a good *catalogue raisonnée*, would have been as much as most people could really study to advantage during a few visits; and study is the best use of such a collection; the tribe of mere exhibition loungers do not care for studies of this kind much, though they have duly learned the lesson that it is not right to say so. And when we come to think of the two collections, both opened at once in rather ill-advised rivalry, there is almost a feeling of bewilderment at the extent of the treasures.

This feeling is rather increased, perhaps, at the Grosvenor, by the want of defined grouping of the works by the same hand; drawings by various masters being intermingled and scattered about by twos and threes, so as to render comparative study difficult. This neglect of grouping rather surprises us, as the grouping system has been rigidly carried out in the case of the water-colours, and certainly the studies require such assistance from logical collocation more than any modern drawings. The artist who is most specially and consecutively represented is Rembrandt, whose sketches occupy great part of one of the tables in the East Gallery. They are not all of equal interest by any means, and in fact they make a finer appearance in the catalogue than in reality. Some of them are so exceedingly rough and slight, as to have rather an historic than an artistic value,—which of course must be rated at its due worth; but the manner of describing them in the catalogue is absurd in some cases. No. 298, for instance, a "Winter Scene in Holland" is described as a "highly-finished drawing in sepia." We should like to know what is to be called a "sketch," if this is a highly-finished drawing. "Study of a female nude figure" (305) should also be rather termed "sketch," for that cannot rightly be termed a "study" of the figure in which the legs are merely delineated in straight lines, without any attention to minutiæ of modelling and contour. The sketch, by the way, is a very pretty one, and one wonders where Rembrandt caught a model differing so much from the usual type of Dutch female of his period, as represented in countless paintings. Among the other drawings of the set the finest, perhaps, are of the studies of a camel and a lion (317). These are really "studies" of animal character given with intense force and reality. In that of the lion, the open claw and the mouth with the corners drawn out into a snarl, are remarkably expressive of animal ferocity. Among the works of a higher class of subject, a sepia sketch, which is entitled, "Repose in Egypt" (291), but is really a specimen of that type of "Holy Family" subjects which used to be called a "Riposo," is remarkable for its truly Rembrandtish power of light effect. "A Woman in Dutch Costume" (324) is a slight but very fine study of a figure looking out of a window. A great many first sketches for pictures, marked by the artist's grim and characteristic force, are to be found. One of the most striking is "St. Paul before Felix" (311) in which the play of human weakness is admirably indicated in the figures of Felix and Drusilla,—thoroughly Dutch figures, of course, but representing character that is common to all countries. There is something, perhaps, in the entire neglect of local and historical truth the entire neglecenes of this kind, which even intensifies their human interest.

We can only notice a few of the salient points among the other drawings in the East Gallery, following them in order round the room. Near the commencement of the numbers we come upon a considerable collection of drawings of Mantegna, hardly in his greatest style, but very fascinating in their strange mingling of Gothic and Classic feeling; his "Festival of Bacchus" (37) looks like Nicolas Poussin mediævalised. The drawings are all in that grand and highly-finished monochrome execution which was so favourite a medium of expression with this great and ideal artist, the abstract nature of whose designs would seem almost to become too much realised and localised by the employment of colour in accordance with nature. Quite as interesting as his figure-subjects, however, and more unique of its kind, is Mantegna's grand drawing of a design for a chalice (35), on vellum, with pen and bistre. This is a large-size drawing, showing a chalice with much elaborate detail and many small bas-reliefs; the design is very fine and rich, and the drawing splendid: it is worth while for any one interested in ornamental work to look at it. We must pass over a good many drawings af various masters, just noticing the grace of a figure of a youth by Masaccio (40),—one of the Christ Church College collection; and the fine, though rather loaded, studies of figure compositions in strong sepia by Filippino Lippi. Some studies of heads by Lorenzo di Credi have great refinement of execution; these are in silver-point, as are many of the drawings exhibited. The peculiar significance of the use of this medium is, perhaps, hardly appreciated by many visitors. Every one can see what a delicate line and tone is produced by it, and how admirably it is adapted to the refinements of shading in line; but every one is not alive to the fact that this method of drawing with a metallic point on chemically-prepared paper (something after the method of our modern "indelible" memorandum-books) admitted of no erasure, and that thus all these beautifully-finished drawings which we see in this material were drawn at once as we see them, with no preliminary sketching. The fact that this was such a favourite material with the great Italian painters speaks volumes in itself for the certainty of their knowledge and their power of hand. We next come on a group of Lionardo drawings, some very fine, though not to be compared with the wonderful show of last year; a small head of a youth in red chalk (97), lent by the Earl of Warwick, is very refined. In the large head in chalk (92, from the Christ Church collection) we are again struck with the repetition of that peculiar and fascinating, but, at the same time, affected smile which is prevalent in the female heads of Da Vinci, and certainly amounts to a mannerism, and, in the end, not a pleasant one: fascinating, we have called it, but it is so in a rather weird fashion; we should not trust a woman with that smile, as we should one of Raffaelle's beautiful human faces. Andrea Verocchio's design for a window (99) must, of course, be looked at by the architectural visitor; but it is not good.

A considerable number of drawings by Correggio form a group of special interest, as his drawings and studies are by no means so familiar to us as those of some other leading names. They are nearly all highly finished, as we should expect drawings by Correggio to be; and nearly all remarkable for grace and prettiness rather than any higher qualities. There is some power in the large study for the head of an angel (115), called in the catalogue "life-size," but in reality colossal; and there is a beautiful piece of careful foreshortening of the countenance (that difficult feat in drawing) in the angel's head looking upwards (114), and a grace peculiar to the artist in the figure of the Virgin in 109. There are some studies for child-angels for the "hash of frogs," and other angelic figures in various stages of development and various attitudes of graceful (?) and conventional kicking, such as was once thought peculiarly appropriate for angels on a ceiling. Altogether, with all their fine finish, these are not drawings one would go very far out of one's way to see. How different is the kind of power we perceive in such a drawing as the "Venus and Cupid" of Titian (133) which hangs near this; a pen-drawing, rough in style in comparison with the Correggio drawings, but full of natural life and vigour. The Venus here leans back with one hand on the rock on which she is seated, with a fine but perfectly natural and spontaneous action. A curious landscape drawing by Titian, with a figure of a cripple drawn in a small cart in the foreground (141), is to be noticed; and, what is of more special interest, one or two sketches of first thoughts for the "Peter Martyr" picture, differing, however, considerably from the picture as completed. Giorgione's "Adoration of the Magi" (132), showing a group of dignified old men seen in half-length with their attention directed towards the central group, is a very fine and homogeneous composition; his small and highly-finished study for a figure for a drinking-fountain, a boy stringing a bow and placed in a niche, may also be noted. By Bartolommeo there are several studies, including a portrait of Savonarola, a less ascetic and more filled-out face than we usually see in portraits of the Luther of Italy. A study of a girl's head, looking down (155), is of exquisite grace in pose and expression.

We must pass lightly over the Rubens and Vandyck drawings, which are not mostly of the highest interest, though one cannot but be struck with the almost brute force of Rubens's sketch-portrait of the Earl of Arundel (163), a man who must have held his own pretty well wherever he went; and also with the vigour of the same artist's portrayal of "David Slaying Goliath" (169), with his foot on the head of the fallen Philistine, whose eye glares upwards in rage and apprehension of the coming blow. Among these Dutch drawings is appropriately placed one by Vandyck's follower, Lely, a very refined and careful portrait study in Indian ink of a full-length of a gentleman in the dress of the period, full of the ultra-aristocratic manner which was so peculiarly developed under the *régime* of the Stuarts. The drawing is so entirely successful in the character aimed at as to make us understand very well the secret of Lely's success as a fashionable portrait-painter. Vandyck's "Judgment of Paris" (193) is very vulgar both as a drawing of nude figures and as a rendering of a poetic legend. Among the Dutch drawings nothing struck us so much as a very small landscape by De Koningh (219), remarkable in the perfection of its perspective and the look of distance, one feels that one could travel into it and over all the successive grades of distance; and all this effect is got almost entirely by drawing, with little help from aërial perspective. There is another landscape of about the same size and style by De Koningh, and nearly as fine, on the table among the Rembrandt drawings. Rembrandt's "Susannah, a study for a nude figure" (226), at all events deprives those wicked "Elders" of any shred of excuse for their improper behaviour. There are a number of fine drawings by Ostade, more especially "Interior of a Cottage" (231); a three-quarter length portrait of a lady, by Frans Hals (water-colour on vellum), which is magnificent in its way, stately in pose, and forcible in execution; there are studies of cows by A. Van der Velde and Paul Potter, hung next each other, which serve to show that Van der Velde was the better man even at cows, in spite of the name Paul Potter has got for this special branch of painting; there are some Cuyps of moderate interest (Cuyp is not much without his colour, after all); there is a sketch by Backhuysen (277), "A Sea Piece on the Y" (which it appears to us should therefore be called a *river* piece) which illustrates finely the peculiar power this artist possessed of giving movement and what we may call "floatation" to his shipping; and there is a drawing by Jan Steen, "Le bon Vivant en Ménage" (256), which is one of the finest things in the room, and remarkable for showing real and keen pathos, which we do not generally look for from Jan Steen. It represents a half-drunken man who seems to have fallen on the floor after, as we may suppose, making himself generally disagreeable for some time previously; his unhappy wife sits weeping with her face buried in her hands. Did the artist give it the title printed in the catalogue? There is a keen satire in the title, which the drawing fully carries out.

The screens or tables are rich in isolated items of great interest. Among these are two drawings by Gerard Dow, studies of figures (357, 361), of which the first in particular is beautiful, the face carefully drawn in a foreshortened position, the hands very delicately delineated. A study by A. Van der Velde, called simply "A Boor" (341), deserves special notice; it is remarkably fine and complete in drawing and in delineation of character. By his brother William there is a study of the stern of a ship (called absurdly in the catalogue

"the *helm* of a ship"), which, as an illustration of Van der Velde's study of ship-painting may be compared with his side elevation of a ship at Burlington House (mentioned in our article on the drawings there); this is called, by the way, a "design," but we imagine it is more properly a study from an existing vessel; a regular old tea-wagon thing, with her quarter buried in gilt moulding and "flummery." The Dutch, at all events, had not the excuse for thus overloading the sterns of their ships with ornament, which was once made for the French shipbuilders during the time of our war with the republic,—viz., that it was the part most frequently exhibited to the enemy, and therefore should be made as presentable as possible! On the second screen, we compare with some interest drawings by Guardi and Canaletto, only to confirm our long-formed opinion that the merits of the latter as a painter of architecture have been much overrated; in the matter of style and manner in architectural sketching Guardi's "View in Venice" (383) is just perfect, and beats Canaletto quite out of the field. The view of old Westminster Bridge, by the latter, has, however, very great topographical interest. Perhaps the most interesting thing of all on this second screen is the sheet of six studies of the proportions of the figure, "given by Andrea del Verocchio to his pupil, Leonardo da Vinci" (402). The figures are divided out into compartments lettered for reference, but it is not easy, without any description, to trace out what is the principle intended to be recommended in regard to the proportions of the different parts. The highest interest of the drawing consists in its having been one of the lesson-books, as we may say, of Leonardo da Vinci. It is from the Christ Church collection.

In the vestibule is a collection of Claude's studies of landscapes, which do not, however, suggest anything new in regard to Claude's art and practice; they certainly seem to confirm the theory suggested with so much probability by Mr. Seymour Haden in regard to the *Liber Veritatis*, that it was intended as a catalogue rather than an artistic work, for none of these drawings suggest the style of the *Liber* except one, which we imagine is one of that collection; the rest are much more finished, and present a much fuller and more complete effect. Some of the studies of trees are very beautiful as to general effect, although a close inspection of them seems to show that Claude troubled himself little about special character of ramification or foliage in various species of trees. A tree was a tree to him,—a mass of foliage,—and studied as such simply, in its lights and darks and curves; the touches in detail are conventional in manner, and almost in what we should now think a "drawing-copy" style.

Michelangelo's large cartoon of "Charity," which faces the visitor on entering the vestibule, is almost too faded and too badly lighted (under glass) to be well seen. The finest among the few drawings by him is certainly the red chalk drawing of the "Holy Family" (496); this, though on a small scale, is a grand work in the master's greatest style, both of thought and execution; the attitude and expression of the sleeping infant Jesus may compare in supernatural dignity with that other wonderful infant in the "San Sisto Madonna." A slight sketch in pen and bistre of one of the compartments of the Sistine Chapel will be looked at with interest. The sculpture gallery contains some drawings by Raffaelle, but none of them of much importance, comparatively speaking. What interest us more in this small room are some drawings by Holbein and Albert Dürer. Among the former is a remarkable design for a dagger-sheath, representing a battle; a bas-relief crowded with small figures, represented not in the usual mode of bas-relief, but in perspective, so as to give an extended view over the groups of combatants. Among Albert Dürer's drawings is a very spirited and remarkably classic-looking design for a figure of Apollo, to surmount a drinking-fountain, and two studies from the life, in silver-point, of a by no means classic-looking female, which studies seem, nevertheless, to have been intended to serve as the basis for a picture of Venus,—a very German Venus.

Albert Hall Exhibition.—The exhibition of works of fine art here will be opened to the public on Monday, February 3. The private view will be given on the Saturday previously.

A NEW HOUSE IN MADRID.

ONE of the newest and at the same time the most curious mansions in Madrid is undoubtedly the Palais de Xifre, giving on to the Prado, and not far from the Picture Gallery, but on the opposite side. The style of architecture is Persian, and the decoration arabesque. Señor Francisco Cubas is the architect who has raised this most remarkable dwelling, while it owes to Señor Francisco Contreras the beautiful sculpture that embellishes its walls. The outside of the mansion, though interesting and peculiar, does not produce anything approaching the startling effect of the internal decorations. The hall, on entering, seems ablaze with brilliant colours. Blue, especially light blue, predominates, brightened by sparkling gold and vivid vermilion, while here and there a little brown has a sobering effect, and effectually prevents what might otherwise be considered a gaudy exaggeration. In a moment, the eye becomes inured to this startling display of colour, and then we gradually discover that it all covers the most beautiful arabesque work, that it helps to delineate each curve, to give relief to the embossments. Around the hall there are graceful pillars of white marble supporting portions of the first floor; and to the left will be found a splendid flight of white marble steps, protected by a white balustrade and bronze latticework. Opposite the balustrade there is an enamelled frieze of diamond-shaped bricks, each about 2 in. square, and of different colours. A beautiful frieze runs from pillar to pillar, but the double range crossing the centre of the hall is perforated, and this adds greatly to the lightness and delicacy of the arabesque designs. The staircase admits a view upwards more than two stories high: while, by placing looking-glasses opposite each other on the first landing, a grandiose optical delusion is produced, as the glasses reproduce over and over again the splendid surrounding decorations. To the right of the first floor landing, and commanding a very fine view of the Prado, is what we might call a balcony-room, firstly because it protrudes from the main building, and secondly, because it is so completely surrounded by windows reaching from the ceiling to the floor, that the look-out is as little impeded as that enjoyed on an ordinary balcony. The prevalence of glass has not, however, prevented the introduction here as elsewhere of the most careful decoration. The arabesques that cover the ceiling are in fact far more delicate in design, sober in their tints, and give a more perfect example of the harmony of colours which was the pride of the ancient Moors.

In the various apartments, we remarked more particularly the marquetry doors, of Persian design, which blended admirably with the surroundings. The decorations of the ceilings were also especially noticeable for the variety of design. These were generally divided into squares of about 18 in., but it was impossible to find two squares alike in the designs they enclosed. The luxury of the bath-room was thoroughly Oriental. The bath-room was composed entirely of marble, and measured about 3 yards square and 4 ft. in depth; but the water could be entirely covered by means of two huge marble slabs fixed on little wheels, and which, by turning the handle of a very simple mechanism, roll readily over the bath. Though this remarkable house is about completed, it is not yet finished. Already, however, one or two items of furniture had made their appearance, and these were in thorough keeping with the general style of the mansion. At the same time we must confess that an Arabian towel-horse and the Oriental three-legged wooden stool seemed strange in Europe, and did not suggest an idea of great comfort. In fact, notwithstanding the undoubted beauty of this mansion, it would never suit any one but a person wealthy enough to possess several houses. It would be impossible to purchase any object from an ordinary shop for this extraordinary house. The most comfortable or graceful article of modern furniture, the richest ornament that was not strictly Oriental in its style, would look glaringly out of place in this mansion. In a short time the inhabitants of such a dwelling would tire of being compelled to thus restrict their purchases. What would be far more practical would be the decoration of a part of a house or mansion in this manner,—just as at the Hôtel Continental of Paris, where all visitors admire the Moorish reading-room.

With a view to facilitating the spread of this new fashion of decoration, several adepts in Moorish art have associated themselves together, and have contrived a system by which they can export to all countries the means of converting an ordinary room into a Moorish saloon. The measurements of the room in question have to be sent with some slight description of its general disposition. Thereupon, plaster of Paris plaques, coloured or not as desired, are sent, which completely cover the walls with the purest arabesques. We need scarcely point out that, in Spain, with such models as the Alcazar, the Alhambra, and the Mosque of Cordova, the purity of the Moorish art may, without difficulty, be reproduced. Already in England one or two persons have availed themselves of this easy method of having an Oriental room without any particular trouble. Señor Belmas (Calle Almirante, 2, Madrid) is one of the principal promoters of this enterprise, and will give all information that may be required. A Moorish room in most English mansions may ultimately become as much a convention as the necessity of having a conservatory.

THE ACCIDENT ON BOARD H.M.S. *THUNDERER*.

THE lessons to be obtained from such an accident as that which has befallen the 38-ton gun in the turret of the *Thunderer* will, no doubt, be taken to heart by the authorities, and applied in such a way as to avoid, if possible, a repetition of the causes which led to it. If the explosion which burst the gun was rendered excessive on account of the ball having been separated from the charge, then any defects in the mechanical arrangements that may have been responsible for this mishap are, no doubt, capable of being remedied. If such accidents could be altogether insured against by the adoption of mechanism outside the gun itself, they might be made matters of the most remote contingency. The comparative merits of rival systems of working guns on board ship, however, are unfortunately not the most important nor the most difficult part of the problem for providing thoroughly reliable artillery. Whether Scott's or Armstrong's or Moncrieff's system is used, so long as the charge and the shot are properly placed in the gun, none of these can be held responsible for what takes place when the gun is fired. It is just possible that the accident may revive the warfare which had almost ceased between the rival systems of breech and muzzle loading; though it is difficult to see how any arguments in favour of the former can be gathered from what has happened. If it is maintained that no such position of the ball is possible in a breach-loading cannon, this statement must not be used so as to lead to the conclusion that there is any inherent defect in the muzzle-loading system which is likely to lead to the ball becoming separated from the charge. A certain amount of care is necessary in the working of both systems, and that being so, the one must not necessarily be condemned in favour of the other, simply because a disaster has occurred through carelessness. It is very doubtful if the presumed separation of the charge from the shot can have been the cause of the accident. The merits of the two systems will have to be decided, if they have not already been decided. Altogether apart from the accident on board the *Thunderer*, no doubt those who are interested in the breech-loading system, and who have lost largely by the successful introduction of the muzzle-loading guns, known as "Frasers," at Woolwich, will revive the controversy, but it will require a considerable amount of ingenuity to convince practical men that the muzzle-loading system was really responsible for the recent accident. From all that can be gathered at present, it is most probable some condition at present unknown, and altogether unconnected with the merits of the rival systems, that must be held to have been the cause of the disaster.

It would not be altogether true to say that we know no more about the essential conditions of safety in a big gun than the constructors of the artillery which so often proved disastrous to those who worked it during the warfare of the four centuries that followed on the introduction of gunpowder. For practical purposes, however, we are almost as much in the dark about the immediate causes of the accident in the turret of the *Thunderer*, as the courtiers of King James II. of Scotland were about the causes of the explosion by which that un-

fortunate monarch had his thigh shattered at the siege of Roxburgh Castle. Previously to the Crimean War, it may be said that we were as ignorant as a fifteenth-century artilleryman, and if it had not been for the labours of Mr. Robert Mallet there is no great reason to suppose that our ignorance would have been much enlightened. The removal of the Government ordnance foundry from Moorfields to Woolwich followed upon the explosion of a mould in which the casting of a cannon was being carried on in presence of a distinguished party of spectators. The accident was predicted by a German stranger, who tried to persuade the moulders to desist, and having failed to do so got himself out of harm's way. The explosion followed upon the contact of the molten metal with the damp interior of the mould, and might have been avoided with a little care. It is different, however, with a big gun. A mould can be examined, and its fitness to receive a charge of molten metal accurately judged of by a practical moulder, but it is not so with large cannon. They are practically in the same category with steam boilers, hydraulic accumulators, compressed air receivers, and every appliance which is subjected to a strain adjusted to materials which are supposed to be of a uniform strength, but the strength of which is, after all, only a supposition. Structural strains, such as those in iron roofs, are not to be classed in the same way, because, except in the case of single girders or supports, they are made up of so many parts that a fair average strength of material amounts to a certainty. If the accident on board the *Thunderer* was due to weakness of material, this will probably be traced, as the fractures are sure to have followed the planes of least resistance in the neighbourhood of the explosion, and their appearance will be sufficient ground for forming a judgment as to this point; but unfortunately such knowledge can only be purchased at the cost of a burst gun, and generally of several lives as well. Mr. Mallet was successful in tracing the causes which led to structural and molecular weakness in the construction of big guns, and this has enabled us to provide against them to a great extent; but it is well known that iron may be able to resist a proof strain that is fatal to its safety when it is afterwards subjected to a long repeated course of lesser strain. So long as the strength of materials of which guns are made is dependent on the care of the manufacturer only, without any more reliable guarantee than a proof charge which may permanently injure the whole structure, we can have no certainty that any gun in the service is safe from such a failure as that which occurred in the turret of the *Thunderer*. One of the greatest benefits that science can possibly bestow on the department of the mechanical engineer, as well as the artilleryman, is the discovery of some reliable method of judging of the soundness of a structure after the labour of the workman is at end upon the iron from which it has been made. The difference of the manner in which castings, and even forgings, are allowed to cool makes all the difference, in many cases, between efficiency and weakness, and after the normal temperature is reached we are still in ignorance of their true condition until after they have failed. Much has no doubt been done to insure as far as possible that a certain standard of strength has been reached, and perhaps no better method of doing this has ever been introduced than in subjecting the iron or steel in a fluid state to a uniform pressure while in process of crystallisation. It is to the same principle that we owe the high standard of strength so generally reached in bar-iron subjected to the pressure of the rolling-mill uniformly in a direction at right angles to its length; but what is still urgently needed is some method of judging of the efficiency of a structure without subjecting it to an excessive strain.

The late Sir Francis Grant, P.R.A.—The will, dated February 4, 1873, of Sir Francis Grant, late of the Lodge, Melton Mowbray, and of 27, Sussex-place, Regent's Park, who died on October 5, 1878, was proved on the 27th ult. by Dame Isabella Elizabeth Grant, the widow; Lieut.-Col. Francis Richard Charles Grant, the son; and Charles Thomas Constantine, the nephew, the surviving executors, the personal estate in the United Kingdom being sworn under 20,000*l*. The only persons interested under the will are the testator's wife and children.

A NEW WORK BY M. VIOLLET-LE-DUC.

THE new work recently published by M. Viollet-le-Duc,—the history of a Town-hall and a Cathedral,*—and which, for some time past, has been expected with interest,—is thus reviewed by the well-known art-critic, M. Philippe Burby, in the *République Française*.

M. Viollet-le-Duc has just made an important addition to that historical and artistic, technical and critical, series of works, of which we have announced, during the past five years, the different parts as they were published,—"The History of a House," the first to appear, "The History of a Fortress," "The History of Human Habitations," and now, "The History of a Town-hall and a Cathedral."

And so, in the quiet of the study, rises before one's eyes the constituent elements of our past civilisation, narrated and rendered intelligible by drawings of extraordinary exactitude. Architecture is before us as on a stage. We see it in its most rudimentary form, serving merely to protect the human animal; then, disengaged from the mud of the first materials, sheltering the family from the inclemencies of the weather; and then the moral and civil freedom of the man. Finally, by the choice of materials, by the suitability and harmony of the surroundings in the midst of which it is created, the beauty of its ornament, architecture offers to the critic who seeks to devolve by study its great laws and lessons a grave field for meditation.

The work of M. Viollet-le-Duc, in its written pages alone, is an example. Previously to composing these volumes, which we would wish to see in the hands of all scholars and students, M. Viollet-le-Duc published his "Dictionnaires" and "Entretiens," in whose pages we all have received our education as critics, and learnt to borrow arms to resist the tactics which now exist in all official channels, circumscribing the critic in the narrow space of a few journals and reviews.

It is the spirit of this profoundly national work, consecrated as it is to the demonstration more than the exaltation of French genius, it is the unshakable faith in a not far distant return to good methods and doctrines of construction and ornament, which is the reliance for the near future. If there is in the arts which are brought in contact directly or permanently with the masses a point which it is necessary to protect from the fatal effects of a pseudo-classic influence which obtains from abroad its inspirations for the future, if young France wishes to see her public monuments, her fortresses, even her houses, express her pride and grace, her good sense and skill, she must break with superannuated doctrines, and revive the more exact study and traditions of her great architect-masons of the Middle Ages and the dawn of the Renaissance.

In this volume, as in his preceding Histories (of which M. Hetzel has recently re-published the series in uniform size), M. Viollet-le-Duc takes a monument from its earliest foundations, follows it through its history in the numerous and often radical modifications which it cannot fail to undergo in invasions, by civil war, by partial fire, by change of fashion, and, more than all, by restoration. Naturally the monument is placed in a position which gives the pretext for a typical history.

Here, in "the city of Clusiacum, which rises in amphitheatral form on the side of a hill, at the foot of which runs a little river," the Roman *Prætorium* occupies the highest point on the north; on one of the sides of the market-place rises the ancient *Curiæ*. The Franks approach; they seize without resistance a city from which Roman conquest and occupation have taken all sentiment of independence, and it is the Christian bishop who alone obtains by gold the salvation of the city. The Franks, installed, are converted to Christianity; the Curiæ, the old municipal edifice, has no longer any need for its existence; and the cathedral rises, enlarging the basilica raised on the site of the Temple of Diana. The bishop takes upon himself all the moral, the civil, and the military power. In the eighth century an abbey shares a portion of this rich benefice, and in the last years of the eleventh century the city, which has only floated from episcopal and priestly power into that of royalty or the seigneurs, commences to form into a *commune* or parish, and the people determine to build a monument suitable for the assembly of the citizens, the old Curiæ now being little better than a dilapidated barn.

The programme was thus prepared; a tower to contain a room for the archives, seals, banners, and all the more important and precious treasures of the community; this tower is surmounted by a belfry, furnished with three bells; a watch-tower, from which all the points of the town were visible. On the site of the old Curiæ, a vaulted room for the meeting of the *dixainiers*, and a prison; above, the meeting-hall of the citizens, and a gallery opening on the *Grand Place* to address the people.

To this programme so clearly detailed are added, as is usual with M. Viollet-le-Duc, drawings of plans, and sections, and elevations, animated by a crowd always in action, and appropriate to the occasion. Such, for example, as a view of the Hôtel de Ville in the twelfth century; and, later, a view in perspective of the cathedral of Cluny at the commencement of the thirteenth century.

These two edifices, the cathedral and the town-hall, see generation after generation of the citizens pass before them or enter them, battling out the noblest problems of the existence of individuals and of nations.

What, as author and artist, has been the endeavour of M. Viollet-le-Duc to show is, how and why the cathedral has been, in the same proportion as the town-hall, the visible sign of the efforts made at certain epochs to constitute itself in the face of the feudal power of the past, and the book closes with this instructive sentence,—Our love for our native country is in proportion to our knowledge of its history, and if we wish to instil this spirit into the minds of the public, its history must become familiar to all.

When the book itself reaches us we may have some words of our own to say about it; what we have printed is the opinion of a friendly fellow-countryman of the author.

* Histoire d'un Hôtel de Ville et d'une Cathédrale. Texte et Dessins par E. Viollet-le-Duc. One volume, 8vo. Hetzel et Cie., Paris.

ELEMENTARY ART EDUCATION IN ENGLAND.

THERE can be no question at all that the means of artistic education for the youth of England have vastly increased of late years, and no one can doubt that the sound teaching of art must increase the growth of true culture. For there is no single thing which is more the cause of a false and affected enthusiasm for art than an ignorance of its elements. Every year the readers of *Punch* are able to laugh over some life-like sketch of the pseudo-amateur of art, yet his or her sayings would be quite impossible had this individual received any serious training in the elements of the fine arts. To what extent elementary education in art is now carried in this country may be gathered from the recently published Report (the 25th) of the Science and Art Department of the Committee of Council on Education for the year 1878. It is a volume which, as may be gathered from its title, deals with other matters than art, which are equally important in their own sphere; but is one also which contains a considerable mass of statistics, by no means very inviting literary fare for the ordinary reader. Yet its contents are really, if carefully considered, of very considerable interest, and not a little suggestive, so that we do not hesitate to give our readers some information culled from its pages, which they would otherwise have no opportunity of obtaining.

The elementary teaching of art in this country at the present time may be said to be divided among three bodies of students, first of all among the scholars in the public elementary or primary schools which exist from one end of England to the other. These are the Board schools and those various primary establishments which are known by various names, and are principally supported from sources other than the rates. There are British, Church, Parochial, National, and other denominational schools. The second division may be called art classes, under which term we include not only art classes proper, but what the authorities at Whitehall class separately,—that is, the training colleges and what we may term miscellaneous classes. By this we mean those which the authorities denominate as "unaided classes," among which rather unsuggestive term are certain bodies in which drawing is taught, and which receive no aid by payments. They com-

prise no fewer than 107 schools, and consist of very various bodies, as will be seen from the following short selection. There are, for instance, St. Matthew's school, Ardwick; the Grammar school, Atherstone; the High School for Girls, Bath; the Mechanics' Institute, Hebden-bridge; and the News Room and Library, at Llandudno. This short list is sufficient evidence of the miscellaneous character of the bodies which are included in this list of "unaided classes." Thirdly, we come to the schools of art, which need very little explanation. Of these three divisions we propose to give a few of what appears to us to be the most important of the most noticeable details. And we should add that when the year 1877 is spoken of, it does not include the whole of that year, since the official year comprises parts of the years 1876-77, which are the subject of the report of the year 1878.

Beginning, then, with our first division, the elementary day or primary schools, we find that the number of these schools in which drawing was taught was 3,767, and that the number of scholars to whom this branch of education was taught was 549,010, of which 403,208 children were examined at the annual examination in the month of March, 1877. These figures present increases respectively over the previous year of (in round numbers) 432 schools, 88,000 children, and 71,800 examinees. The most satisfactory feature in these figures, it needs scarcely be pointed out, is the large increase in the examinees as compared with the actual increase in the number of scholars. The total amount of money granted in aid of instruction in drawing was (again speaking of round numbers) 27,900*l.* or 5,900*l.* more than in 1876. The actual total, however, including the cost of prizes and examples, amounted to 32,000*l.* odd, being on an average 8*l.* 14s. 4d. per school. Of course, the schools where drawing is taught, or at any rate those where there are the largest numbers of pupils, are those in the different towns. The rural districts show fewer pupils than the towns, and we are inclined to think, though we have made no calculations on the matter, that when drawing is taught in rural places it is chiefly in Board Schools. In the metropolis, at any rate, it is evident that the Board Schools give more opportunites for instruction in drawing than other schools, as appears by the following extract from the Report of the Assistant Examiner in the Art Division, who visited 253 elementary schools in London. He speaks thus:—"The Board Schools possess peculiar advantages. The time set apart for drawing is liberally fixed at two hours for each boy, and one hour and a half for each girl per week. The children are relieved from all necessity of finding their own materials. In schools other than Board Schools no uniformity exists in reference to amount of time for drawing; whilst in no instance does instruction in drawing occupy more than two hours per week, it sometimes has only one half-hour allotted to it. The children are generally required to provide their own materials, and in many instances the parents, either through disinclination or actual poverty, fail to supply what is necessary. . . . . The subject of geometry is thus often entirely neglected, and the same cause acts as an impediment to the efficient teaching of freehand and model drawing." We are not now concerned with the policy of teaching drawing in elementary schools. We will assume, since the Legislature sanctions the payment of money for its encouragement, that it is advisable that children should be taught the elements of drawing; certainly we ourselves think so; and if they are, it is obvious that they should be taught it systematically, and in sufficient periods to make some real impression upon them.

We must now pass on to the other two divisions of this subject. We find the number of training colleges where drawing was taught amounts to forty-seven, and in these, in round numbers, 3,700 students were examined and 800 teachers and pupil-teachers, whilst in the year 1868, which affords an approximate comparison of the increase in the last ten years, 2,000 pupils were examined, but only 187 teachers and pupil-teachers. Hence there has been a very considerable increase, especially among the teachers. Touching as we are merely on some of the most prominent facts of this subject, so as to give an outline of the elementary art-teaching among the artisan classes in this country at the present time, we will not dwell longer on this point, but pass on to the second branch of schools of this division,—the art classes. Here the number of students was 29,500 in 910 classes, showing a decrease of about 2,500 in students, and, on the other hand, an increase of nearly fifty classes. But it is satisfactory to observe that though the actual number of students has decreased, there has been a slight increase in the number of those who sent up work for examination, so that the genuine amount of education has, it may fairly be said, increased rather than decreased among these bodies; and it may be well here to explain in two or three words the composition of these art-classes, for there is no difficulty in regard to the other schools and colleges upon which we have already touched. They consist of classes for children above twelve years of age and artisans. In these classes the primary instruction of the children is carried further than in the elementary schools, and they are associated with adult students in the study of form, light and shade, and linear drawing. Here, in fact, begins the real elementary education in drawing, which may really have an influence upon our artisans, for the training in the elementary schools can assuredly do very little in this direction.

Finally, we must touch in a few lines on the schools of art which are entirely devoted to art instruction, where the student, after having obtained sound elementary knowledge, pursues the technical study of art in the direction required by his occupation. As the crowning part of the edifice, we have the National Art Training School, which is maintained for teaching art-teachers, designers, and art-workmen. The total number of schools of art in operation was 144, containing in round numbers 29,400 pupils, thus showing, as regards fees, an increase of about 3,000*l.* over the previous year. From these schools of art, 138,199 drawings were sent up for examination, and of these 790 were referred to the national competition.

Finally, in the National Art Training School there were, during the year ending July 31st, 1877, forty-one students in training, and fourteen national scholars, who not only were free students, but likewise received weekly allowances, varying from 10s. to 35s. each. But in connexion both with this National Training School and the schools of art scattered throughout Great Britain, there are various points, both of importance and interest, which we must reserve for notice on another occasion. What we have now said will bring out with a certain prominence the general scope of the instruction in elementary drawing as a part of national education, and in fine art as applied to industry, and some important details in regard to the teaching of art in the higher schools will remain to be touched on hereafter.

We wish we could believe that the results of the large organisations now in operation are fully what they should be.

SHALL WE HAVE THE DRAMA OR THE PENNY GAFF?

AT a season when such unusual distress is pressing, not only on the poorest, but on many who have been long accustomed to the enjoyment of every comfort, or even of every luxury, of life, the expression "seasonable amusement" may seem somewhat to jar upon the ear. Nor would that feeling be inappropriate in the case of any effort to stifle the questioning of anxious thought under the veil of idle trifling, or of uproarious jollity. Such, however, is not the aspect under which we approach the subject. As far back as written history reaches, and to that yet more distant time of the habits and manners of which we have only rare and quaint indications (such as those afforded by the famous Etruscan dice, or by the yet ruder and quainter implements of sport yielded by lake dwellings or barrows), we have evidence of the direction of no small amount of human skill to the organisation of amusement. The greatest founders of empires have considered it a part of their wisdom to provide for the amusement of their people. Among those nations which were the most skilled in architecture and in engineering, public amusement rose to a level with the noblest arts. And those literary works which rank among the chief treasures of mankind,—the masterpieces of Greek verse, and the chief glory of the English tongue,—are, in their type and essence, efforts to amuse, in the highest and noblest sense of the word.

It is as to the ennobling character of amusement that we wish to add one or two remarks to those which have recently been brought before public attention. Amusement man will have. Nay, no one familiar with history doubts that it has been at the very moments when peril and distress are most urgent that the efforts to snatch a fearful joy are apt to become most frantic. The *Decamerone* was an effort to cheer the profound gloom and terror spread by the ravages of the plague in Florence. The annals of that frightful saturnalia of mob-rule and of murder, the Reign of Terror in Paris, are lurid with the glow of drunken orgies, and echo the rattle of the dice-box. The soldiers of the Roman Procurator threw dice for the seamless robe, under the shadow of the preternatural eclipse. Among northern nations, where hunger is sharpened by cold, and where the brain is not so quickly maddened by alcohol as is the case in warmer climates, great feasts, and especially great drinking bouts, have usually been the favourite form of amusement. So much has that habit prevailed among the Norse, the Danish, and the sturdy hunter tribes of Northern Europe, that heaven itself is pictured in their hymns as the scene of a perpetual orgy; where Odin and his fellow immortals enjoy an immortality of strong drink.

Where climate woos mankind to a gentler existence; where the fierce heat of six weeks or two months of summer disposes the Italian or the Greek to make the most of the cool evening and the bright moonlight; where nature enforces sobriety, because madness is the consequence of excess in alcoholic drink; the need of organised amusement of a higher order than that of the banquet first became evident. In Greece and in Italy we find the first examples of the dedication of the intellect to the provision of a feast, not for the body, but for the mind. Lofty grave tragedians arose, to purify the mind, as Aristotle remarks, by pity and by fear, before the art of music had been developed into the condition of a sensuous and luxurious charm. The music of Greece was extremely simple, the musical instruments were few in number, and rude in form, and the science of music was not only unknown, but undreamed of, at the time when the noblest masterpiece of the drama dominated the imaginations of the auditors of Æschylus, of Sophocles, and of Euripides. In endeavouring to understand how, in times so comparatively rude, such unapproached majesty should have characterised the Grecian tragic drama, we must remember, not only the influence of climate, but that of the genius of the people. Let any one wander through the more remote districts of Italy, and converse with the people. Still better, let him listen as they converse with one another. You hear, at a little distance, a frantic hubbub,—voices screaming one against another, or it may be one long-drawn recitation, causing a momentary silence. You see eyes flashing, figures agitated from head to foot, the hands thrown out as if in struggle, or spread forth with a deprecatory gesture. You see two or three people on their way along a mountain path or city street, and at every few steps one of them halts, throws himself athwart the path, turns his back in the direction of his journey, and enforces some long story on his comrades. What does it all mean? It means that the people are, as a race, born actors. They cannot narrate the simplest occurrence without an accompaniment of dramatic tone and representation. The graceful and resonant Italian tongue lends itself with extraordinary ease to the *improvisatore*. The very length and flow of the words seem to call for accompanying action of hand and figure. It is at times possible to understand very sufficiently the purport of a conversation by watching the speakers, even if the spectator is out of earshot. So much is this the case that there is in Naples a special theatre devoted to that mute action which we call pantomime. In the little *Theatro di Policinello* at Naples, while the secondary members of the troupe dress and speak much as in other theatres, the chief performer does neither. He utters no sound. His dress is a loose white jacket, trousers, and night-cap. The upper part of his face is covered with a black mask. But so perfect is the command possessed by this actor—who is *Policinello*, himself—of dramatic action, that his dumb-show charms, fascinates, and stirs the audience as few actors or singers elsewhere can do. The mode in which comic mischief, ardent love, ready rascality, or abject terror, are telegraphed by this voiceless figure, so as to touch the very hearts of the audience, is such as no language can describe.

In the universal use of dramatic action in Italy and Greece may be detected one of the great causes of the early triumphs of the Greek drama. We are not confounding two distinct races in so saying, for the Adriatic seaboard of Italy is the *Magna Grecia* of Classic times, and is peopled by a race of Hellenic blood. The old characteristics of Homeric Greece, its division into numerous states or cities, each, however small in its area, keeping within the fence of its distinct nationality, and having few dealings but such as are of a hostile nature with its surrounding neighbours, are distinct at the present day, in this part of Italy. How far the idea which has taken such firm hold of the peninsula, from the Alps to the Ionian Sea, of *Italia Una*, may tend to confuse the distinctions which have survived from Classic through Mediæval times, remains to be seen; but it must take at least two or three generations to effect any great change. We may instance the little city of Monopoli,—a name probably but little familiar to most of our readers. It lies on the Adriatic seaboard, between Bari and Brindisi, and is the only natural port on that part of the coast. It is small, but sheltered and deep. An English man-of-war, such as three-deckers used to be, could ride in safety in its shelter; and that so close to the shore that an active midshipman might leap from one of the yards on to the loggia of a palace that borders the port; in which, from your bedroom window, you look sheer down through 40 ft. of clear sea-water. Here there is a theatre, supported for the most part by local talent as well as by local funds. And the nobles and burghers of Monopoli are proud to claim,—and that with no small degree of justice,—that the Monopolitan stage produces more good acting than is to be found on the Neapolitan stage; with the sole exception, perhaps, of the *Theatro di Fiorentini*, which is devoted to the classical Italian drama.

Among a people thus dramatic by their very blood, it is perfectly conceivable both how great dramatic poets should have arisen, at an early stage of national life, and how the masterpieces of these master playwrights should have formed a part of the moral code, almost of the very religion, of the country. Times were already growing out of joint when the great comedian, Aristophanes,—no less native a product of the soil than the great tragedians,—felt so secure of the support of the mass of the populace as to dare, not only to satirise those in power, but to laugh at the gods as well as at men. The evil effects of the law of Solon, which gave voting power to the populace, was illustrated by the mischievous licence of Aristophanes. There is no doubt that this licence was one of the great causes of the judicial murder of Socrates,—that crime against humanity. The wonderful powers of the poet in those days may be estimated from this single portion of history. It was a power, as exerted by Aristophanes, almost wholly mischievous; and in its mischief and its licence, as directed to tickle the palates of those who had little to lose, and who entertained a national,—or, we may rather say a human,—envy of those who had much to enjoy, if not to spare, became an evil of tenfold power, because it woke the plaudits of the many. But this fact should not blind our eyes to the powerful and ennobling effect of the dramas of the great tragedians. A profound sense of the power, and of the interference with human events, of the immortals; a conviction of that sure retribution of impiety which was shadowed forth by the terrible fiction of the Furies; a fear of broken treaty, of broken truth, of sacrilege against the temple, the enclosures, or the priests, of the national religion (of which the sanction extended to the office of the herald, as it lingers even to the present day amongst ourselves, is a relic),—these powerful and vital convictions formed the very backbone of the Greek tragic drama. And the influence on the people of such representations as those of the great trilogies of Æschylus must have been far more profound than that of any teaching, of which we have any account, on the part of the priesthood; if not than that of nine-tenths of the utterances from the pulpits of the present day.

Between an art of this kind,—lofty, severe, deeply instinct not so much with the local religion of towns or cities as directed to the worship of special tutelary divinities, as with that deeper and truer idea of faith, honour, fear of the recompense surely attending on conscious wrong-doing, which underlies every form of religion, if it have any truth whatever,—and the art which panders to the idle, thoughtless passions of the weakest of the race, the contrast is as diametric as can be well conceived. It was so in the time of Aristophanes; it is so at the present time. It is, however, unfortunately too true that, if the votes of a nation be counted, and not weighed, or if, as with ourselves, it is on the pence of the millions that the dramatist or the caterer of public amusement has mainly to rely for support, the lower art will elbow out the art which is higher and more severe. It is no satire, no injustice, to say that whenever the multitude is left as the sole judge, the worse is likely to displace the better. The most extreme views will always find more favour with the mass than those which are more balanced and reserved. The man who goes farthest,—in speech and promise at least,—is the greatest favourite of the moment. The latest novelty commands the largest audience. And if with, or even without, the graces of style, of diction, or of personation, the innuendo can be made more palpable, and at the same time more unutterable; the envenomed sting of satire can be sharpened to the keenest edge, and infixed in the noblest subject; or the last fragment of sexual delicacy can be most openly riven; there will be found the more ready support from the pence of the million.

Considerations similar to, or at all events perfectly harmonious with, the above, must, we conceive, have been long familiar to the mind which,—in spite of the fashionable doctrine of the day, the divine right of *laissez-faire*, and that grovelling adulation of the most ignorant of our fellows, of which men high in name, and once high in influence, have set so pernicious an example,—has ventured to plead the cause of the drama as a subtle, powerful, and unrivalled engine of national elevation and instruction, and as a scourge of the evils which beset society. If it be certain, as we hold it to be, that a nation will have amusement, organised either for it or by it; if it be certain that the more this organisation, or the encouragement and the payment of this organisation, is left to the taste of the masses, the more loud, violent, scurrilous, indecent, and profane will the amusements which replace tragedy on the stage tend to become; if we remember to what untold depths of infamy public representations sank among the law-abiding Romans,—a people once as chaste and pure as they were fierce, warlike, and skilful in construction; we may certainly feel startled at the course we are taking in this matter, as well as at the railway velocity which it has attained. The cost of the appeal to the eye is now so overwhelming that little or nothing is left to pay for the appeal to the nobler emotions of the soul.

There is, we apprehend, at present some slackening in the energy of that violent crusade urged on the part of the clergy against the drama, which has been characteristic both of the settled purpose of the Church of Rome, and of the anxious missionary enterprise of the Evangelical party in the Church of England some half century ago. At all events, the partisans of such a crusade are now comparatively silent, out of the pale of their own special disciples. Speaking with all respect of inherent intolerance of this nature, we would yet ask those who feel it to glance at history, and to endeavour to form some practical conception of human nature and of the way to elevate it. There may be room for a conflict as to the thesis "How much better it would be if everybody always went daily to church, instead of going sometimes to a theatre." It is unnecessary here to discuss such a position. It is not one of any practical utility. It is not one as to whether there is the remotest chance of its coming on for useful discussion in our day. What is a practical thesis for debate, however, is that "So many millions of our countrymen desire to go, do go, and will go, to some form of dramatic entertainment. It is a want—be it healthy or otherwise—for which provision must be made. Is it the part of people of good sense, or of honest men, to cast up their hands and eyes and howl at what they call this depravity in their neighbours, or to do their best to insure that the amusements which they certainly will have shall be of an ennobling, instead of a debasing character?" Let us remember that the work will be hard enough to effect the change. Such a change is not—like the sweeping substitution before referred to,—wholly visionary, impracticable, and out of the question. But it is a task of much difficulty; only to be accomplished by the strenuous and combined exertion of all those by whom the future of England is regarded as something to which they stand in the relation of trustees.

There is another consideration which should not be without extraordinary weight. In the opinion of the immense majority of judges, German as well as English (we doubt whether the Latin nations can fully approach Teutonic or Anglo-Teutonic literature), the noblest writing in the English tongue occurs in the dramatic form. We may go much further, and take with us, if not so commanding a majority, yet, at all events, a very considerable following, in saying that the noblest writing since the times of Æschylus and Sophocles is that of an English dramatist. The genius of Shakspeare is unique. Any attempt,—and who shall count the number that have been made,—to discover the secret of his fascination by critical analysis is something like an attempt to investigate the immortality of the soul by vivisection. Faults,—he is full of them. He would not be human were it otherwise. At times he has even sported with a disregard of that great law of the unities of the drama, the observance of which is one of the main sources of the power of the Greek tragedians,—

> "Jumping o'er times;
> Turning the accomplishment of many years
> Into an hour-glass."

Who stays to lisp out the word "anachronism" when we listen for the striking of the clock in "Macbeth," when we hear of the use of cannon in the early wars of England, when we go by sea to Illyria? Compared with the technic workmanship of the Greek dramatists, the plays of Shakspeare recall the bas-reliefs of the Mediæval artists, such as those on the Gates of Paradise, once described in our columns, where pictorial groups are made up of the repeated acting of the same individuals, sequent events being grouped in place instead of in time, or contrasted with the simple designs of Flaxman, or with the grouping on a Greek cameo. But in this very reliance on the power of his own magic to compel the assent of the heart, in spite of the active calculating power of the mind, we trace one of those splendid faults of Shakspeare, which are so much superior to the steady and level excellencies of other poets.

Shakspeare, as his writings prove, even in his time had to strive against that tendency which led to the victory of Aristophanes over the graver forms of drama. This is perhaps most evident in the choice of his subjects. If we consider what the tone of his day was, the delicacy of his motives, and even of his comic incidents, is not the least wonderful characteristic of his plays. If it be true that it was the virgin queen herself who proposed "Falstaff in love" as the subject of a play, the treatment of the "Merry Wives of Windsor" most signally illustrates the truth of the foregoing remark. In scenes where the lofty tragedy of the principal characters out-tops the mists of the Thames, and might have been apt to overshoot a London audience, the lighting touch of humour brings the heaven of the tragedian into instant connexion with the earth in which his audience stands. In the whole range of literature there is nothing more human, more magical, more humorous, than the question of Fluellen, after the noble and reverent speech of Henry V.,—'Is it not lawful, an please your majesty, to tell how many is killed?"

But we must pause. The theme is one that is apt to become uncontrollable. The point now reached is,—can there be a more worthy effort for English gentlemen to make than one which has for its object to bring the lofty and yet practical and intelligible teaching of the first of English dramatists home to the masses for whom he wrote?

The Female School of Art.—With reference to a recent exhibition of works by the students here, it is agreeable to learn that two water-colour studies of flowers by Anne E. Hopkinson have been purchased by her Majesty the Queen, viz., a study of roses and a study of primroses and orchids; and that the National Gold Medal drawing from the antique, by Mary Katherine Benson, and a National Bronze Medal drawing (study of mice) by Maud Ashley West, have been purchased by the Department of Science and Art. The following have been admitted during the past year as students in the Royal Academy Schools:—Alice Hanslip, Ida Lovering, Mary Katherine Benson, Susan Ruth Canton, Frances Binns, Louisa Jacobs, Margaret Dicksee, and Sarah Alice Miller.

"WHISTLER *v.* RUSKIN" AGAIN.

THE first thing that strikes us in the pamphlet which Mr. Whistler has unadvisedly published under the above title, is, why it should be considered peculiarly suitable that a pamphlet issued by an artist should be printed on the roughest paper with uncut edges, and with a cover which looks as if originally intended to wrap up sugar in. But the reading of the pamphlet dispels any idea of unsuitability in this respect. Mr. Whistler's literary style is as untrimmed as his paper; and if he has said some smart things about people who write and cannot draw, he has at least offered himself as a practical example of a man who can draw but cannot write. Apart from the mere question of style, from the literary vulgarity of the interlarding of every sentence with foreign words, and the uncouth constructions on every page, the writer has largely indulged in that very fault of personality and strong language for the use of which he brought his action against Mr. Ruskin; so that the whole thing is a scolding match on both sides.

Putting the manner of the pamphlet on one side, a word may be said about its matter. There are two or three good hits in it, and we by no means say that an onslaught on art-critics is an amusement entirely without provocation. The opinion expressed, that the art-critic *par excellence* is a growth of modern life, and has no counterpart in the past, is to a great extent true; and the remark that the said art-critic, professing to write only for the good of art, is nevertheless continually lamenting the inferiority of modern art, and pointing to its triumphs at a time when "art-critics," in a modern sense, did not exist, is at least cleverly put. For ourselves, with a long acquaintance with artists, we feel considerable sympathy with the hearty dislike which many of them have for the full-blown art-critic,—the gentleman who has never made a drawing in his life, could not make one to save his life, but can talk about everything connected with art with an assumption of more than knowledge,—of omniscience. Even, however, in his case it must be remembered that the existence of this highly-developed form of critic, and the fact that he finds his profession a very profitable one, is a proof that there is a large demand for critical writing; and people can hardly be blamed for supplying that demand. The fact is, we live in an age very much given to talk, especially talk about art and literature, and people who cannot trust their own wits to furnish them with that sort of talk are only too glad to get it done for them by critics in magazines. It is not a very healthy state of things; but it is certainly not entirely the fault of the critic: he is merely the natural result of it.

But though we may concede that the modern critic "takes too much upon him," Mr. Whistler is quite mistaken in supposing, if he does suppose it, that in any former period of art (that was worth anything) there was no such thing as an expression of public opinion on the work of the artist, or that such opinion can safely be held as matter of indifference by him. Art enjoys the freest and most healthy life, always, in the atmosphere of the freest public opinion, without which it would be apt to degenerate into the mere indulgence of the fancies of a clique of enthusiasts,—a phenomenon which we are not without an instance of in contemporary English art, among a certain set of artists who affect to decline public exhibition and only dispose of their works in private to a select circle of admirers. And though Mr. Whistler evidently thinks society was made for art, it is, perhaps, quite as fair an extreme to say that art was made for society,—for cultivated society, of course; and if an artist through any wrong-headedness persists in painting what, in despite of any technical cleverness, is without any interest for cultured people at large, the critic is only acting as their mouthpiece (the only mouthpiece they have) in saying so. We do not expect the artist to like him for it; but he will often do wisely to consider the critic's opinion, even if the latter could not paint a picture himself, on the well-known ground that "lookers-on see most of the game." Indeed, the idea that no one is to be considered a competent judge of any art unless he is a master of its *technique* himself, has only to be stated for any rational person to see its absurdity. It is contradicted by the whole practice and theory of cultivated society in all ages.

There is, however, a much stronger claim to be made by writers about art upon the sympathies and goodwill of the artists, in that it is mainly through art-criticism and art-literature that the majority of persons know anything about art at all. How many men would know anything about the works and the genius of the great Italian painters, but for the literary man? And how many of the public would be capable of forming even as good a judgment of art as they do form, but for the guidance and hints of those who, without being artists, have given thought and study to the subject? And how would the artists, after all, like to be without the notice of the press? This last point is of peculiar force in the present case, for we shrewdly suspect that, unless Mr. Whistler's "Nocturnes," and his other works of that class had been well pushed (as they have been) by some of his friends and admirers among the "critics," they would never have obtained the notice and admiration they have (we say not here whether rightly or wrongly) obtained.

Mr. Whistler's pamphlet will probably have amused a good many people; but we more than half suspect that, even with artists, three-fourths of the laugh it may have raised has been against and not with the writer of it, who would do better to keep to his brush and let the pen alone.

ST. ALBAN'S ABBEY.

THE NAVE ROOF.

SIR,—I wish somebody had taken the pains six months ago to prepare the carefully measured drawing which you have agreed to give this week in the *Builder*. It would probably have made a great deal of difference in the course of the controversy, and would have spared me several rather painful days spent in the midst of cold cutting winds, snow, and ice. When I came to the conclusion that the controversy might last for ever, unless this drawing were made, and no one else undertook to make it, it became as clearly my duty as it is now to prepare some explanatory notes.*

I have felt during this controversy that it was open to any good-natured friend,—for I do not know that I have an enemy,—to say that I was taking too much upon myself; and as this has been said in various cheerful tones, I feel that I have no right to expostulate, but every right to explain, that when the question was the possibility of repairing the old roof I would not,—being one against the world,—state publicly the conclusions I had come to until another architect had verified them. What I said so carefully in my "Report" of last July on this head has met with nothing but confirmation, and it has now become a kind of slander to say that *anybody* (except Sir E. Beckett, who is isolated in a way which must be full of comfort to him) *ever* thought the old roof was incapable of repair. Now that the battle of the pitches is being strenuously fought out, I feel that I ought not to flinch or to be reticent. The pitch was merely alluded to in my paper at the Society of Antiquaries, which was devoted almost wholly to a description of the construction of the existing roof. As to the exact form and details of old work, I am not disposed to give way to any one's assertions, having been myself trained to habits of accurate investigation. About inferences from facts, modesty makes confidence less defiant.

It seemed to me at first that it would be indispensable to write here about "intentional misrepresentation," "covert sneers," "insinuations," "angelic dispositions," "nonsense," and "hairdressers." I got an argument into good trim, setting many jewels of that sort with care,—probably the performance would have been pronounced "telling" when it was published. Reflection has, however, made me doubt whether intemperate and offensive language can be used with propriety in a controversy by any one who is not a skilful lawyer, nor at all grey-headed, nor bald. Besides, I wish to be brief, and a man must believe himself a favourite of Fortune when he attempts to demolish another in two lines on a postcard.

1. The walls of the tower are of tiles, generally 17 in. by 12 in. by 1½ in., with mortar joints almost as thick as the tiles themselves. Previously to 1871 the whole of the surfaces were covered with plaster. This was taken off, and the tilework repaired, and the whole of the joints pointed in cement, under the direction of Sir G. G. Scott (see "Neale's St. Alban's," pp. 2 and 24). The drawing shows the tiles which appear to be new, or to have been disturbed since the original erection of the tower. Of course, too much importance must not be attached to every tile, as some tiles have been replaced in almost every portion of every wall in the course of repairs. There is a distinctly cut groove running from A to B, and a similar groove from C to D. Facts about these grooves are given by enlarged portions, and by a detailed section. These grooves do not seem to be mere chisellings of already finished tilework. Some of the tiles have shaped edges. Possibly the original shingle covering fitted into the grooves. A line drawn along the two lengths of groove will strike upon the existing coping of the parapet. This is the only roof-line actually marked upon the tower wall,—the only line which indubitably points to an abutting roof; it exists distinctly as a straight line, as to the dimensions of which there can be no mistake. A line drawn along the two lengths of groove, will also run for its whole length on the new tilework inserted by Sir G. G. Scott. A similar line on the south side of the centre will also run for its whole length on new tilework. The new tilework has wholly destroyed distinct traces of the groove, but its presence prepares us to believe readily and firmly that the wall once had continuous grooves for both slopes. Mr. Scott's suggested roof-lines run for some considerable portion of their length over original unaltered tilework, without any marks of a groove. Mr. Street, in his drawing shown at the Society of Antiquaries, on November 28, made this line of groove, A B—C D, the only line of the high-pitched roof, being unable to recognise any other as supported by facts.

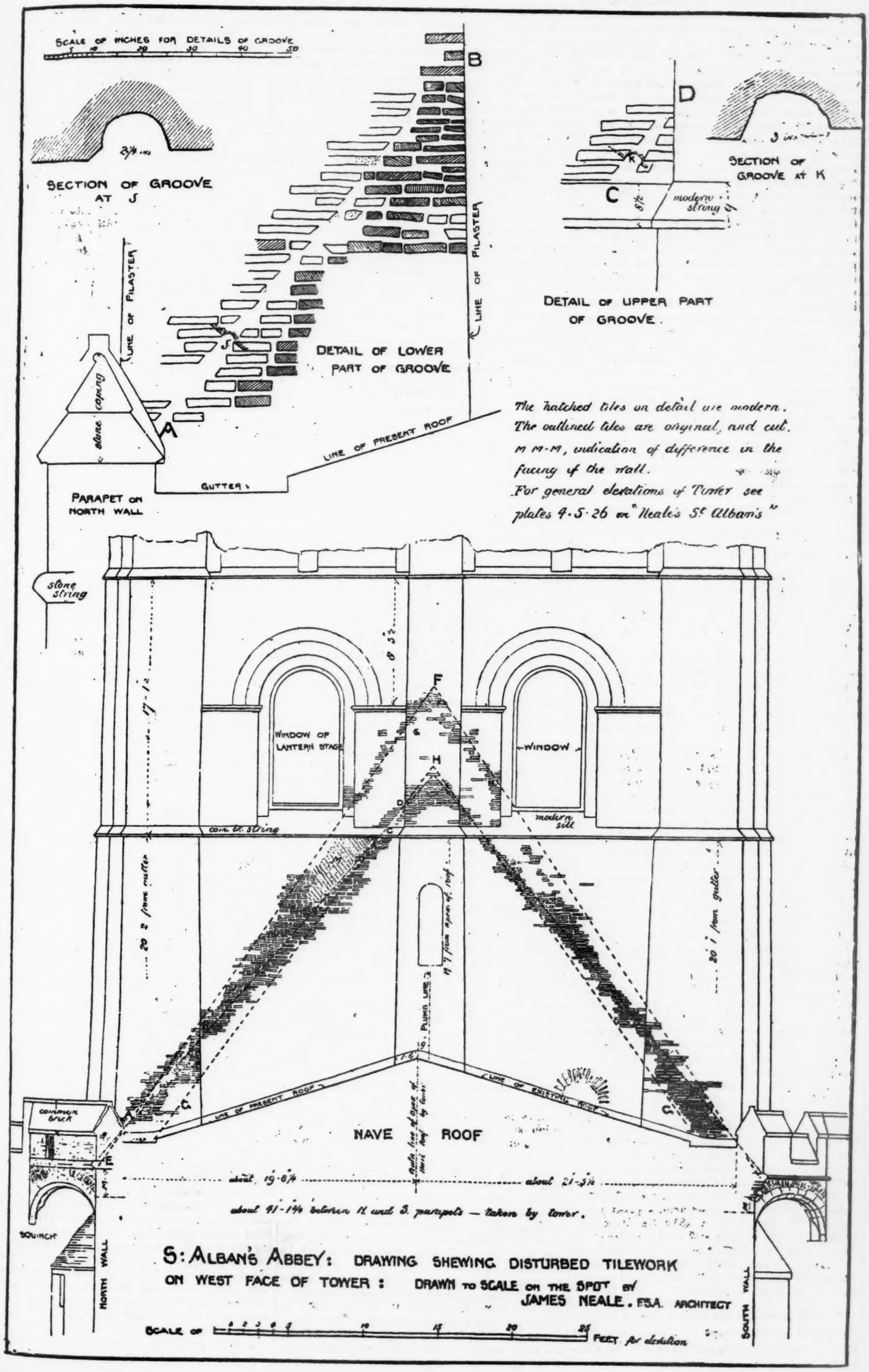
2. Mr. J. O. Scott believes that there was a roof-line running from E to F, and that this was the line of the original Norman roof. The line does not run over disturbed and renewed tilework in the tower for any considerable portion of its length. It obviously would not admit parapets; and perhaps never existed except for the sake of argument; at any rate, as no one proposes to follow it in the restoration, so its precise meaning is not a practical question.

3. Mr. Scott believes also that there was a roof-line running from G to H, and that this was the original Early English roof. This line does not run over the disturbed and renewed tilework of the tower wall for the whole of its length, but portions of it run over *original unaltered* tilework without any mark of a groove. No one who will carefully study this drawing or visit the building, and spend a proper time there, can believe that this lower line,—which it is intended to follow for the new roof,—is capable of being soberly argued for. There is not a particle of evidence that any such roof-line really existed. It should be observed that both Mr. Scott's lines disregard the groove A B—C D in the strangest way. The line G H has been imagined for the mere purpose of getting gutters of a fair width inside the parapets, and might quite as fairly have been drawn anywhere else. The new roof will represent an outline which was *never* taken before by any roof abutting against the western face of the tower, of which any traces remain. The Faculty Committee are thinking about giving to the nave of the church an aspect which it had never actually had at any time. This is a kind of "conservative restoration" which has never been argued for under that name before.

4. With anything like the present arrangement of parapets and gutters, no high-pitched roof, abutting for its whole length against the disturbed tilework, could have been put over the nave. The parapets would have necessarily been much higher than they are, and the tower walls clearly show that no such monstrously disproportionate parapet walls ever existed. There is an entire absence of good evidence that a high-pitched roof was ever put over the Decorated bays. The pitches of the lines of disturbed tilework on the other sides of the tower, the existence of the squinches, the levels and characters of the different eaves-courses, the analogy of the other low-pitched roofs in the church, the character of the roof itself,—all might be brought forward again, and every fact shown to be consistent with the belief that the present roof over the eastern portion of the nave represents the original roof, erected after the completion of the stonework of the Decorated bays.

5. Many matters, which I venture to think of

* I shall be very happy to show my original drawing to Mr. Scott or any one else; and allow anybody to examine it to any extent. It was made on the spot, and every dimension is figured.


SCALE OF INCHES FOR DETAILS OF GROOVE
SECTION OF GROOVE AT J
SECTION OF GROOVE AT K
DETAIL OF LOWER PART OF GROOVE
DETAIL OF UPPER PART OF GROOVE.
LINE OF PILASTER
LINE OF PRESENT ROOF
GUTTER
PARAPET ON NORTH WALL
stone coping
The hatched tiles on detail are modern. The outlined tiles are original, and cut. M M-M, indication of difference in the facing of the wall.
For general elevations of Tower see plates 4·5·26 in "Neale's St Albans"
stone string
WINDOW OF LANTERN STAGE
WINDOW
modern sill
cont. br. string
NAVE ROOF
LINE OF EXISTING ROOF
about 19-8¼
about 21-3¼
about 41-1½ between N and S. parapets — taken by tower.
SQUINCH
NORTH WALL
SOUTH WALL
S: ALBAN'S ABBEY: DRAWING SHEWING DISTURBED TILEWORK ON WEST FACE OF TOWER: DRAWN TO SCALE ON THE SPOT BY JAMES NEALE. F.S.A. ARCHITECT
SCALE OF
FEET for elevation

minor importance, have been brought into this controversy, and discussed at great length. I will resist the temptation which has beguiled others, contenting myself with dealing in a conclusive way with what is at the present moment the main point—for all who truly respect, and resent pure innovations in, our ancient buildings. As Selby has been several times quoted as a precedent, it should, however, be noted that its central tower is a seventeenth-century construction, not of rare merit; that the question of the part to be played by the transepts in the grouping did not arise as at St. Alban's; that, in fact, the churches are so entirely different in size, situation, and character that any comparison must be purely misleading.

6. Being a sanguine person, I am still hopeful that the voice of reason will penetrate to the Faculty Committee. The old roof might be repaired to last for centuries,—much of the lead covering might remain untouched,—a strong wish has been expressed to retain the ceilings unaltered. The only high-pitched roof which has been *conclusively proved* (by the actual groove) to have existed, could not have stood between the present parapets. No new timber has yet been obtained for the roof: the question is, therefore, still open. Why should it not be decided in accordance with the views of the majority of architects and antiquaries, who would be deeply pained to see the old aspect of St. Alban's tampered with?—who are unwilling that "restoration" should be discredited by being identified in such a prominent instance with disregard of facts, and of the claims of antiquity,—and with the indulgence of wilful caprice.

JAMES NEALE, F.S.A., Architect.

ST. ALBAN'S CATHEDRAL.

SIR,—It has amused as well as astonished me to look on at your grand restoration fray anent St. Alban's roof: the combatants innocently ignoring all changes in that building during their own grandfathers' days, or even since them.

Two or three object to a high roof (on any of the arms), as having interfered, if it ever existed, with the tower windows, whose present sills and upright jambs they take as quite authentic Norman. Nothing but the arch-heads are even so old as our present precious century!

Not only does Carter's "Ancient Architecture," plate 17 (dated 1797), show you these as the upper halves of *simple circles* (obviously the fittest form for any two windows so placed over the slopes of a roof), and his opposite page of letterpress state that "the second part is the ringing-room, lighted by *circular* openings"; but in the Society of Antiquaries' great monograph of the building, published 1813, he thus describes the tower (p. 7):—"It has two rows of windows, four in the lower, two in the upper, each divided into two bays by short round pillars; the space between the three arches is lighted by a number of triangular holes. Under the lowest row are two *circular* openings." He appears to restrict the term "window" to openings with horizontal sills. Again, a south-east view by Coney, dated 1824, for the "Monasticon," shows the simple circles, but probably after they had really been cut down and deepened into the present rectangular-bottomed lights; for it is truly remarkable that all the plates to the above great monograph, each dated 1810, contradict the letterpress by showing these as at present.

Another novelty, anticipated by none of the engravers, is the tier of square panels on the outside of the chancel clearstory, one over each of the ten windows. Again, Mr. Neale describes the piece of flat ceiling west of the tower, painted in smaller squares than the rest of the nave, namely six in the width, instead of four, as lately disclosed by removing the hideous four-panelled ceiling. But Carter's great plan, dated 1810, and Coney's, 1819 (in Dugdale), both mark the six-panelled design entire; the former with the Assumption, or "Coronation of Our Lady," in two middle panels, which Carter repeats at large in his plate 19, without a hint that any of it was concealed. E. L. G.

*** We print this not with a view of helping those who desire to erect a lofty roof, but with the feeling that no information should be withheld.

THE EXCAVATIONS AT OLYMPIA.

RESPECTING the progress which has been made in the excavations which are being carried out under the direction of a number of German *savans*, at the expense of the Imperial Government of Germany, some interesting particulars have just been published by the *Reichsanzeiger*, or Imperial Gazette. The fourth campaign, or series of excavations, commenced after a summer vacation of four months and a half, on the 16th of October last, with a staff of 250 native labourers. In the previous winter and spring, the north of the Altis had been opened, displaying a stately row of edifices of very varied character. The object in view in the new excavations was to explore the southern and eastern portions of the sacred district. From the south the excavating party expected to ascertain the boundary in that direction of the Altis, with the festal arch for grand processions, and to learn something of the sanctuary of Hippodameia, and the numerous buildings which extended outside the sacred grove down to the banks of the Aphæus. On the east, the eastern Altis wall, two colonnades mentioned by Pausanias, and the *Stadion*, were the objects to be sought for; and further, in the north-west, the *Prytaneion* and the *Gymnasion*.

By the end of the first week in December, after only seven weeks' labour, the excavating party had accomplished a large portion of their task. They had found and identified several of the edifices they were in search of, besides making a number of unexpected discoveries of importance.

Almost with the first turn of the spade there were found in the north-western corner between the Heraion and the north Altis gate remains of an ancient building, which was without difficulty recognised as the Prytaneion of the Eleans. According to Pausanias's description, this edifice contained a large dining-hall, in which the Olympic victors were entertained; and a sanctuary of Hestia, from the altar of which the ashes used to be carried to the great altar of Zeus. At the destruction of Olympia this building did not escape the common fate; but the ancient ground-plan, so far as the earth has hitherto been removed, is readily recognised. About the large hall, as a centre, there are grouped several rooms, in one of which there are still large portions of two mosaic floors. The chief front of this Prytaneion is formed by a Doric colonnade, of which two columns still remain *in situ*. Judged by the form of their capitals, they belong to the best period of Grecian architecture; but they show, as compared with their diameter, quite an abnormal axial width from column to column (6¾ lower diameters),—a proportion possessed by no other Doric edifice.

The second discovery of importance was made in the south of the Altis. At a distance of only forty mètres from the Temple of Zeus, the southern boundary-wall of the sacred enclosure was met with. This was a surprise, as the wall had been previously looked for much farther south. Important as this discovery is for the topography of Olympia, it is of still greater importance in its practical bearings on the further prosecution of the excavations, inasmuch as the area of the Altis, which had hitherto been calculated only on conjectural data, has turned out to be smaller than had been assumed. It is now evident that it will be possible to lay open the whole of the sacred district, with its numerous buildings, aqueducts, altars, and pedestals, in the course of two years from the present time.

Nearly in the middle of the southern Altis wall, opposite the chief front of the Temple of Zeus, a structure was discovered which may be safely described as an Altis gate. Its advantageous position, right opposite the terrace which stretches along the east front of the Temple of Zeus, and which is still adorned with more than forty pedestals for votive offerings and altars, appears to justify the assumption that this gate was the festal gate of Olympia, through which the embassies from states and cities entered the sacred grove in solemn procession. As the western boundary-wall of the Altis, containing two smaller entrance-gates, was laid open last year, and as, moreover, in the north the Kronos Hill forms a natural boundary to the sacred enclosure, while now the southern boundary-wall, with the festal entrance, had also been discovered, it only remained to determine the eastern boundary of the district whose central point was the great altar of Zeus. As early as last winter a wall was here found which there were many grounds for regarding as the eastern wall of the Altis. Further digging has now shown that that wall, in conjunction with a second parallel line of wall, formed a large side-hall which, commencing at the secret entrance of the Stadion, at the foot of the Kronion, occupied almost the entire eastern side of the Altis, having a length of about 100 mètres, and forming a noble architectonic conclusion to the entire inclosure. This is, without doubt, that hall mentioned by Pausanias and other writers of antiquity, and which, after its wall paintings, was called the "Variegated Hall," and which, from its sevenfold echo, also bore the name of the "Stoa of the Echo." On its west front there were forty slender Ionic columns rising on three marble steps, and crowned with a noble entablature. A second row of columns divided the interior of the hall into two longitudinal sections. The hind wall was closed, and in ancient times was adorned with the wall-paintings above mentioned. In front of the hall there extended an unbroken series of monuments and dedicatory gifts, of which all that remains are the pedestals upon which they stood.

Another edifice of importance was found in the south, outside the Altis. It is a hall, likewise with double nave, probably about 80 mètres in length, and belonging to the Roman period. On the exterior it possessed Doric columns and entablature, while the interior pillars are Corinthian. After most of the buildings of Olympia were destroyed, this hall, like the Temple of Zeus, remained standing for a long time. The two edifices formed respectively the north and south side of the Byzantine quadrilateral, the eastern and western walls of which were built from the ruins of Olympia. At a later time, viz., shortly before the great inundation of Altis and its being overspread with sand, the southern hall, perhaps in consequence of an earthquake, fell to ruins, and hence we find the columns, capitals, and entablatures at the present day precisely in the same spot where they fell centuries ago.

Besides these four important edifices, this year's excavations have furnished a large quantity of separate fragments of buildings valuable for the history of architecture. The Byzantine fortification above referred to was particularly productive. Pieces of one Ionic and four Doric edifices were here found. Among the remains of the latter are portions with well-preserved coloured ornamentation, such as have seldom been observed hitherto; and especially interesting are the half-column capitals which adorned the Ionic interior of the Philippeion. Their exact date (soon after 338 B.C.), not less than their strict style, render these capitals some of the most valuable illustrations of the entire Corinthian order.

ST. MARY EXTRA, SOUTHAMPTON.

Board Schools.—The School Board for St. Mary Extra, which is a district separated from Southampton proper by the river Itchen, and not under the Southampton School Board, recently advertised for plans in competition for a school for 350 boys, and master's residence. Eleven sets of designs were sent in under motto, the design marked "Clausentum" (Mr. W. H. Mitchell, architect, Southampton), being selected. His plans having received the sanction of the Educational Department, and the Board having obtained the requisite borrowing powers, they have decided to carry out the work and commence the buildings early in the spring. The tender of Mr. J. W. Roland, a local builder, amounting to 2,770*l.*, has been accepted, which is exclusive of school fittings and furniture. The estimated cost, including conveyance of land, architect's commission, fittings, &c., is 3,800*l.*

The Cemetery.—The great increase in the population of this district, mainly attributable to the establishment in its midst of the large shipbuilding works of Messrs. Oswald, Mordaunt, & Co., combined with the overcrowded state of the parish church-yard, led during the past year to the establishment of a Burial Board. A site having been obtained, the Board invited the local architects to supply designs in competition for the chapels, entrance-lodge, and laying out the cemetery, the result being the selection of the design marked "Gabriel Grub," the architect being Mr. W. H. Mitchell. Tenders were received, both for laying out the ground and the erection of the buildings by the Board, at their last meeting, when it was decided to carry out the work forthwith. The total cost, including site, &c., is estimated at 3,000*l.*

LIGHTHOUSE AT THE ENTRANCE TO SWAN RIVER, WESTERN AUSTRALIA.
MR. J. H. THOMAS, ARCHITECT.

LIGHTHOUSE, FREMANTLE, WESTERN AUSTRALIA.

THIS lighthouse, recently erected from designs by Mr. J. H. Thomas, C.E., Director of Public Works, is situated on Arthur's Head, on the south side of the entrance to Swan River, in lat. 32° 03′ 14″ south, and long. 115° 45′ 12″ east. It is a circular stone tower, having a base of 22 ft. diameter, the height above high-water mark to the centre of the cast-iron lantern being 92 ft., and the height of the building from base to vane is 71 ft. The illuminating apparatus is a third-order fixed dioptric light, manufactured by Messrs. Chance Bros., of Birmingham.

REREDOS, BY TILMAN RIEMENSCHNEIDER, IN ST. JAMES'S CHURCH, ROTHENBURG.

WE have frequently had occasion to mention the works of Tilman Riemenschneider, the celebrated sculptor, of Würzburg, and as an example of his work, in marble, we have recently given an engraving of the splendid monument of Bishop Rodolph von Scherenberg (A.D. 1495).

In order to show that this able sculptor was equally excellent in wood-carving, we present our readers with an engraving of a reredos carved by him in the church of St. James at Rothenburg.

This reredos, which is of the "triptych" form so common in Germany, is placed over an altar at the east end of the north aisle in the before-mentioned church. It is composed entirely of oak, and is about 30 ft. high. It may be described as consisting of a "predella," or basement, richly pierced with open tracery, forming a kind of cell, in which is placed a charmingly-executed group, representing the Death of the Virgin. Above this is a noble triptych, which, when the wings are open, displays in the centre the Coronation of the Virgin as Queen of Heaven. A curious feature about the centre portion is that the pierced openings at the back of the figures are glazed, which rather seems to suggest that this altar was intended to stand in front of a window, or in an apse. The effect of stained glass seen through these glazed openings must have been remarkably pretty. The doors or wings of the triptych are adorned with female figures in low relief. Immediately above the triptych is a small niche, containing a bust of St. John the Evangelist, below which is the inscription:—

"IM ENFANG WAR DAS WORT."
("In the beginning was the Word.")

It is very uncommon, indeed, to find a quotation from the Scriptures in the vulgar tongue at this early date, the end of the fifteenth century, but what is still more remarkable is that having translated the text into German they should have inscribed it in Roman characters. It would not have astonished us to have seen the words, "In principio erat verbum," written in black letter, as it was a common practice in the Middle Ages to write Latin in the German lettering; but that they should have translated the Latin into German, and then have converted the German-text into Latin characters, does seem a piece of inconsistency.

The upper portion of this reredos consists of three lofty spires, each composed of two stories of canopy-work, filled with statues, representing our Lord crowned with thorns, Saints John the Baptist, John the Evangelist, Mary, and Mary Magdelene.

The Church of St. James contains two other reredoses, much in the same style as this one, fine stalls, and some excellent old stained glass. The building, however, has been restored in rather an unfeeling way, and has a hard, dry, and uninteresting look, which may, perhaps, please the Germans, but would not be looked upon favourably in this country.

THE CRITERION RESTAURANT AND THEATRE.*

TILL within late years a common reproach to London was the general insufficiency of the accommodation provided for those who, either from necessity or choice, were in the habit of seeking their dinners elsewhere than in their own homes. There were, indeed, the clubs, the best probably in the world; but they supplied the wants of a comparatively small section of the community, and that, too, a section owning, in most cases, houses and establishments of its own. It could boast, moreover, hotels, often of vast proportions, where the prices were generally on a scale of equal grandeur, and where splendour rather than comfort seemed often to be the aim and object of the management. Then, again, in the City and around the law courts were taverns, popularly supposed to have been, in days gone by, the favourite haunts of great and witty men, the fame of whose memories seemed, as it were, to impart an additional flavour to the wines and dishes. Lower down again in the scale came the foreign establishments, which dispensed their hospitalities mostly in the neighbourhood of Leicester-square. Last of all were the little dining-rooms or eating-houses, where the surroundings were generally of a nature to destroy the appetite even of the least fastidious; and, in fact, there were few places where people could lunch or dine at a moderate cost and in a clearly comfortable manner, with the advantage of a *menu* consisting of something beyond a chop or a steak. As this want began to be felt, it was soon found that dirt and discomfort were not absolutely indispensable to economy, and soon certain establishments, principally in connexion with railway stations,—at first in small refreshment-rooms,

* From a paper, by Mr. Thomas Verity, entitled "The Modern Restaurant," read at the Royal Institute of British Architects on the 13th inst., as elsewhere mentioned.

REREDOS IN ST. JAMES'S CHURCH, ROTHENBURG.—END OF THE FIFTEENTH CENTURY.

but lately in handsomely-appointed saloons, such as those at the Midland and Holborn Viaduct Stations.

For this result the public are in no small measure indebted to the proprietors of the Criterion. The site upon which it stands was formerly occupied by two hotels, both celebrated in their time,—the "White Bear" and "Webb's"; the former was one of the old-fashioned galleried inns. These may be considered as examples of the old style, and the present building, being the most important of its kind yet erected, may be taken as a type of the modern house of public entertainment. I hope I shall not be considered egotistical in saying this, but as, after a trial of seven years, the proprietors tell me they can suggest no material alterations, the Criterion may be considered to fairly meet the requirements of this particular business. Without here going into details of the accommodation, I may briefly say that the public portion includes dining-rooms of various capacity, restaurant, grill-room, buffet, smoking-room, a grand hall (now used as a *table d'hôte*, but originally intended for a ball-room), lavatories, retiring and cloak rooms, and, lastly, a theatre. The service departments, to which I shall presently allude more fully, are arranged in a central block one over another, corresponding in level with the different dining-rooms, and in communication with one another by means of lifts and staircases, and comprising kitchens, sculleries, larders, pantries, cleaning-rooms, wine, beer, and ice cellars, and store-rooms for plate, glass, linen, groceries, and all kinds of provisions.

The general arrangements of the building are,—On the ground floor, the principal entrance, which is in the centre of the Piccadilly façade, under a large recessed archway, opening into a rectangular vestibule, 30 ft. by 25 ft., rising through two floors and forming the central means of communication with all the public rooms. The principal staircase, 10 ft. wide, is in the centre of the end opposite the entrance, and leads to the *table d'hôte* and other dining-rooms on the upper floors. On the right of the vestibule is the restaurant, 70 ft. by about 30 ft., and on the left is the buffet, 90 ft. by 25 ft., with smoking-room, 40 ft. by 25 ft., at the farther end. There is also a side entrance to the buffet from Piccadilly, having on the right a small bar, where those with strong palates, or with none at all, may indulge in the fearful concoctions with comical names, so much in vogue on the other side of the Atlantic, and on the left is a cigar-shop. There is another entrance to the buffet from Jermyn-street by the secondary staircase, which runs from the bottom to the top of the house. Advantage has been taken of the difference of level in the two streets, to obtain in a half-basement a second-class dining or grill room, while to gain still greater height for this room, the floor of the smoking-room has been raised 2 ft. above the general level of the ground floor.

On the first-floor, and on the west side of the vestibule, is a room, 50 ft. by 25 ft., devoted to the "diner Parisien," and on the east is a room of similar dimensions for banquets, &c., and ranged along the corridor, leading to Jermyn-street, are private rooms of different sizes, for parties from ten to fifty persons; these rooms are also approached from Jermyn-street by the secondary staircase. On this floor the service to the west or more public rooms is by a separate passage, but for the private rooms is by the general corridor. This at first sight might be considered an objection, but when it is remembered that the visitors would be in the rooms while the dinners were being served, it will be seen that it is not a matter of much moment.

On the second floor, at the Jermyn-street end of the building, there is a large room, approached by either staircase, used principally for Masonic meetings or banquets, and here the service is direct. On this floor, but at a somewhat higher level, is the grand hall, 80 ft. by 50 ft. and 35 ft. high; this room occupies the whole length of the Piccadilly front, and is lighted by the range of great windows looking towards the street, and by a large glazed dome in the centre.

The kitchens and serveries are arranged on six successive stories in a vertical series, as follows:—on the first basement is a kitchen, principally for the grill-room, although much of the roasting for the restaurant and buffet on the ground-floor is done here; this was at first done by a large open dangle, capable of cooking a dozen joints at one time, but it has now been replaced by a gas roasting-oven, which is much more economical, takes up less space, and does not throw out the same amount of heat as the open fire. Adjoining this is the vegetable kitchen and general scullery, and knife, fork, and glass cleaning rooms for the lower part of the house,—no small labour, when it is considered that the average number of dinners and luncheons is 2,000, and upon several occasions the enormous number of 4,500 has been reached. On the ground-floor, the kitchen partakes more of the character of a serving-room for the buffet and restaurant, sauces and light things, such as omelettes, being the only things cooked here; for the rest, the joints and vegetables come from below, and *entrées* and other made dishes from the chief kitchen at the top of the house. On the floor next over this (mezzanine) is the principal plate-cleaning room. On the first floor the service is for the east and west rooms, and the private rooms; on the second floor the service is for the Masonic room and the grand hall,—this may be also served directly from the principal kitchen on the next floor,—the whole series being, as I said before, in direct communication by means of lifts and the servants' staircase.

The idea of an underground theatre was suggested by the Athenée in Paris; but whereas that is only partially sunk, this is entirely below the ground-floor. It was not originally intended as a theatre, but as a small concert-room, and was, indeed, constructed as a square-galleried room, and it was not until the entire carcass was built that it was determined to convert it into a theatre. Its position has been somewhat severely criticised, and all kinds of prophecies were made concerning it, some even going so far as to say that the audience would be stifled; but, from careful observations of the temperature of most of the London theatres, this has been found to compare very favourably with the best. Of course, the ventilation is assisted by artificial means, which I will presently explain more at length. The entrance to the stalls and boxes is on the right of the central archway in Piccadilly, and for the pit and gallery from Jermyn-street; the corridors and staircases throughout being entirely fireproof. Some difficulty arose with the Lord Chamberlain's office at the time it was built as to whether the theatre could be considered a separate building, as the two licences were not allowed for the same building; but, after much controversy with the Metropolitan Board of Works, it was agreed that the floor formed a sufficiently fireproof party division to enable the theatre and restaurant to be considered separate. The entrances were ultimately modified, so that there was no connexion between the two, except through the outer lobbies.

The theatre occupies the whole length of the Piccadilly front, viz., 80 ft., by a width of 50 ft., and the height from the stalls to the ceiling is 27 ft. It is divided into stalls and pit on the lower floor, balcony and boxes on the first tier, and gallery and boxes on the upper tier, and will accommodate over 1,000 persons. The stage is 25 ft. deep, with a proscenium-opening of 22 ft. Dressing-rooms are provided on both sides and under the stage, the entrance for professionals being by a separate staircase in the Jermyn-street area. Cloak and retiring rooms are provided for all classes on both sides of the house. Only very limited storage is provided for properties, &c., the stores and carpenters' shop being elsewhere. By doing this a very serious element of danger from fire is avoided.

The theatre, buffet, restaurant, and grand hall are lighted at night by sunlights, having flues formed in the floors by placing rolled-iron joists about 2 ft. apart, with slate bottoms and covers, to contain the iron pipes, of which each light has three, running some distance from the burner, the outer one being carried as far as the upcast shafts in the walls. The stage having such a limited height, the appliances were of a very special character, particularly as regards lighting. Wing-burners were almost entirely dispensed with, the batten lights being mainly depended upon to light the scene. These have iron hoods, with flue-pipes, coated thickly with Leroy's cement, leading to the extracting-shafts going to the top of the building, the only naked lights on the stage being the float in front.

The planning the arrangements for ventilating and warming this building, with all the various conditions to be met in its several departments, involved considerable contrivance, in order to overcome the structural difficulties, and to obtain the numerous air-shafts in the necessary positions for carrying away the vitiated air and to introduce fresh air. For this reason the apparatus was divided into two divisions: one being the theatre, the large hall, restaurant, &c., and the other for the buffet, smoking-room, grill-room, and the dining-rooms, facing Jermyn-street. For the ventilation of the theatre a fan is provided, 4 ft. 6 in. diameter, worked by a direct-acting steam-engine. It draws its supply down a series of air-shafts, formed in the main eastern wall, and forces it into an air-chamber formed under the floor of the theatre. From this chamber shafts are carried up in the walls to diffuse the fresh air at different levels around the whole space. In addition to these shafts, branch distributing channels are provided for a supply of air for the stalls and the pit. Heating power, composed of hot-water pipes arranged in coils, is fixed in the chambers, in order that the air supplied may be warmed before its distribution when found necessary. A water spray is also fixed in the main cold air supply for cleansing the air. For the extraction of the vitiated air from the body of the theatre, a centre perforation, about 5 ft., is provided, in direct communication with a powerful extraction shaft, 4 ft. by 3 ft., running up the entire height of the building. In order to increase the power of this shaft, the waste heat from the grill stove, and the products of combustion from the sun-burner that lights the theatre, are carried up the centre in independent wrought-iron pipes. At the gallery level, and also at the back of the stage, four other extraction shafts are provided. It is found that when this apparatus is in full working the amount of air supplied and extracted is equal to the entire renewal of the cubic contents of the theatre from five to six times per hour.

The ventilation arrangements for the large hall consist of a series of inlets of fresh air around three sides of the hall, in direct communication with the chamber already described. The vitiated air is removed through the sun-burner, and the perforations round it communicating with a main extractor formed over the dome. The plan adopted for the ventilation of the large hall is generally applied to all the rooms throughout the building. A second fan is provided for forcing the air to the rooms situated towards the Jermyn-street front. The steam boilers are placed in a convenient part of the basement, and are three in number; two of these are in constant work, the third retained as a supernumerary. They supply the steam for all the culinary purposes, for working the cold water and fire service, and the steam for the hot-water supply, and ventilation and heating arrangements. The steam boilers are placed under supervision, and are inspected and cleaned out every two months.

The hot-water services to kitchen, sculleries, lavatories, &c., are worked by a steam heater fixed in the basement, from which a 2-in. continuous flow is carried through the different departments, with suitable outlets where required. The flow terminates in two spacious circulating cisterns, and a return-pipe is taken back to the heater, passing on its road all the lavatories at the Jermyn-street front.

The necessity of easy and rapid communication between the store-rooms on the lowest basement and the kitchens at the top, and on intermediate floors, was provided for by deciding to use a direct-acting hydraulic lift. And as it was seen that a large quantity of water would be required to work it, the questions of water supply and lifting machinery were considered by Messrs. Eastons & Anderson, whom I consulted upon this part of the work, and who drew out a scheme, which was carried out with slight modifications by Messrs. Turner & Co., of East-street. A 5-in. pipe was connected to the Grand Junction Company's main in Piccadilly, which, immediately on entering the building, branched into two pipes, each with a meter attached. One of these pipes supplied the water at high pressure, and the other at low pressure, the rate of charge for the water supplied by the former being 25 per cent. more than for that supplied by the latter. On the roof of the building a cast-iron tank was fixed, measuring about 20 ft. by 30 ft., and about 4 ft. deep, and from it were taken the supplies to the kitchens and other parts of the building, as well as to the lift. In the basement beneath the floor level, a brick tank was made, lined with asphalte, and to it was connected the service from the low-pressure pipe before mentioned, and also the overflow from the other tank. The water discharged

by the lift on its descent is conducted to the brick tank, near which is fixed a steam-pump, which draws the water from the brick tank and forces it up to the cast-iron one on roof. Thus no waste of water occurs, and the cost of the power for working the lift is represented by the steam used for driving the pump. The boilers which are provided for the heating and ventilating, and the cooking apparatus, also supply the steam required by the pump. It is only for short intervals and at different times in the day or night that the Water Company's pressure is sufficient to reach the upper tank, so that practically all the water used is received at low pressure and pumped up. On the high-pressure main and on the supply-pipe to lift are fixed on each floor fire-cocks with hose and connexions; and since the upper tank almost always has some 10,000 gallons of water in it, a large supply is available in case of fire. The hydraulic lift consists of a wrought-turned ram, 7½ in. diameter, working water-tight through a gland at the top of a cylinder sunk into the ground, and has an oak cage on the top of it, with the necessary guides, valves, balance-weight, &c., as usual. The length of the ram exceeds by about 3 ft. the total height of the ascent-cage, which is 72 ft., being the height of the top kitchen floor above the lowest basement. The water-pressure acting on the bottom of the ram pushes it out of the cylinder and so raises the cage. A rope passing through the cage and extending the whole height of the lift-shaft, enables it to be started or stopped by a person inside it or standing on any floor. The well for containing the cylinder of the lift was sunk to a depth below the basement of 80 ft., or 110 ft. below Piccadilly; it was lined with 9-in. brickwork in cement, and finished 3 ft. diameter in the clear. The London clay was not passed through until the extreme bottom of the well was reached, when a little water made its appearance. After the completion of the well it gradually rose until it attained a height of about 60 ft. from the bottom. All the food-lifts are worked by hand by means of an endless rope, and are made with double boxes attached to one another by ropes, so that as one box ascends the other descends.

The basement is considerably below the main sewer in Piccadilly, and it was at one time thought that all the sewage would have to be pumped up, but, fortunately, it was found that in Regent-street, at the end of Jermyn-street, there existed an old sewer 40 ft. below the roadway. Permission to enter this was given, and a barrel-drain was driven up Jermyn-street, into which all the sewage passes. It is perhaps more difficult to keep the drains free in this class of building than in any other, owing to the enormous quantities of fat and refuse of all kinds from the sculleries. Although every provision had been made for arresting and collecting it by means of traps, yet it was found that a large portion of the fat passed away with the water into the down-pipes, where it quickly got chilled and adhered to the pipes, causing partial stoppages; this was at last remedied, by turning the waste steam into them, which has the effect of keeping them warm, and so preventing any deposit. I must say here that the first efforts in this direction were a mistake, as I turned the steam into the cast-iron floor gutters, the result being that owing to expansion and contraction the joints soon became leaky. I have now abandoned floor gutters altogether in kitchens, and carry the waste steam to the stack pipes in the manner above mentioned.

The whole of the ground was excavated to a depth of 30 ft. below the level of Piccadilly, and in a great part the adjoining buildings were underpinned to that depth. In several places water was found, and in order to keep it back I adopted a system which had been successfully tried at the Royal Albert Hall for other purposes, which was, to build the back portion of the underpinning first 1 ft. 2 in. thick, and render it with asphalte, leaving bond for the face work, the bonders being coated with and set in asphalte as the outer work came up. The result is perfectly satisfactory, although in one place the water came through so fast from an old well on the adjoining premises, that it was with great difficulty the asphalte was made to adhere to the bricks. At first, the water thus intercepted ran down the back of the wall and rose under the footings; to carry this off I constructed surface drains with cesspools, and ran it into the main drain, but as the ground consolidated, this ceased in a great measure, and is now scarcely perceptible.

The concrete for foundations, and the mortar, is General Scott's selenitic; the floors throughout are fireproof, the basements and ground floor on Fox & Barrett's principle, and the upper floors on Dennett's system, which I consider above all the best. The reason for using Fox & Barrett's for the lower floors was to form a strong abutment for the houses and ground all round, to take the place of the shores, which it was necessary to strike before it would have been possible to form the floors.

The large size of the rooms on the lower floors necessitated an elaborate arrangement of stanchions and girders to carry the walls above, indeed, broadly speaking, the whole of the interior was constructed in that way. All the main stanchions are protected by brickwork, and the girders either by concrete or plaster.

During the building, various modifications were made from time to time, which, in some cases, caused an entire change of the system of girders; the most notable being that caused by the conversion of the theatre. The box-girder, carrying the west wall of the vestibule, was calculated as being continuous, having bearings on four intermediate stanchions and the walls at either end, which made it a comparatively light one. When it became necessary to remove the two centre stanchions in order to form the circle, a plate-girder, 50 ft. bearing, and 3 ft. 8 in. deep, was inserted under the floor of the great hall, and the lower one hung up to it by slings, brought up to their work by key and cottar connexions; this, considering the roof was on, and the floors formed, was rather an anxious operation, the girder was hoisted in halves, and riveted in place; the amount of deflection in the lower girder being less than 1-16th of an inch, after the removing of the hydraulic jacks which supported it during the alteration.

The Piccadilly roof consists of four Warren girders 17 ft. deep, the roof shape being made by saddle frames fixed to the backs, the whole very light, and giving plenty of space for the dormitories. The Jermyn-street roof is of different construction. The whole of the space being required, there could be no principals; it is therefore formed with an upper and lower curb as tension and compression girders, the whole of the strains being discharged at the angles. The other parts of the building, although in some cases complicated, presented only the difficulties usually met with, and it would be uninteresting if I were to give a further description. I shall therefore proceed to notice the distinguishing feature of the decorations, which is the tile work. I have here used it very extensively as wall decoration, and whatever may be its merits or its faults artistically, it has at least the advantage of being bright and clean, practically indestructible, and not too expensive, and, what is most important, it will wash. It was the first experiment on so large a scale, and I may say I brought the idea with me from South Kensington, where it was then being adopted in the refreshment-rooms, and its many obvious advantages led me to use it so extensively.

When I first proposed to tile the walls, it was thought that the effect would be too like a butcher's shop, but having an opportunity of using it on a smaller scale at the Mansion House Station Restaurant, my clients were convinced of its utility, and determined to adopt it for this building.

The cartoons for the figure subjects were drawn by Mr. Coke, and the work was executed by Messrs. Simpson & Son, who also carried out the painted decorations in the various rooms and in the theatre. The floors of all the rooms are laid out with parquetry by various makers. The vestibule is paved with marble mosaic by Burke, assisted by Italian workmen.

The building now in course of erection on the east side of the Criterion will contain on the ground floor a buffet and smoking-room 29 ft. by 70 ft., with a still-room at the end, to supply both the bar in the present building, and also the additional one. The first floor is designed to be used either as separate dining-rooms, or a suite of Masonic rooms. The upper floor will be in communication with the grand hall, by means of a large opening which may be closed at pleasure by shutters, so that it may be used either as an extension for the table d'hôte, or for private banquets.

The service of all these rooms will be from the present kitchens.

As an example of a similar class of restaurant, Mr. Verity alluded to the "Gaiety," which he has just reconstructed. In effecting this, it became necessary, as our readers have already been told, to take out the whole of the Strand front and a part of the side front, as the former mezzanine was removed to give greater height to the buffet; this involved a work of underpinning probably the most extensive yet accomplished. It was done most skilfully, and with the most satisfactory result, by the contractors, Messrs. George Smith & Co.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE fourth ordinary meeting of the Institute for session 1878–79 was held on Monday evening last, Mr. Charles Barry, president, in the chair.

The following gentlemen were balloted for and declared to be duly elected, viz.:—

As *Fellows:* Mr. John Bryce, Edinburgh; Mr. Percival Gordon Smith (Associate), architect to the Local Government Board; Mr. Thomas Edward Colcutt, Bloomsbury-square; and Mr. Thomas William Cutler (Associate), Queen-square, Bloomsbury.

As *Associates:* Mr. S. C. Searle, Ludgate-hill; Mr. L. E. Hickmott, Rotherham; Mr. J. F. Shenton, Rotherham; Mr. A. F. Watson, Lamport; Mr. W. D. Bayliss, Singapore, Straits Settlements; Mr. F. Pinches, Strand; Mr. C. A. Gould, Great George-street, Westminster; Mr. W. Woodward, Granville-square; and Mr. W. Grellier, Abchurch-lane.

As *Honorary Associate:* Mr. John Everett Millais, R.A., Palace-gate.

The President observed that at the last meeting it was intimated that, with the approval of the members, the Council would, according to precedent, prepare an address of condolence with her Majesty the Queen on the occasion of the affliction with which she had recently been visited. The address which had been sent by the Council was as follows:—

"*The dutiful Address of the Royal Institute of British Architects to her most Gracious Majesty the Queen.*

MAY IT PLEASE YOUR MAJESTY,—The President and Council of the Royal Institute of British Architects, on behalf of themselves and of the other members of their body, desire respectfully to approach your Majesty, not only as the Royal Patron of this Institute, but also as their gracious Sovereign, with an expression of deep-felt sympathy in the early death of your Majesty's beloved daughter, the Princess Alice, Grand Duchess of Hesse-Darmstadt, who, by her self-devotion and thoughtful energy on two momentous occasions, when the whole nation was suffering intense anxiety, secured the affectionate esteem of all classes of the community. The President and Council earnestly implore that Almighty God, who has seen fit again to visit your Majesty with sorrow, may in His goodness and in response to the prayers of a united people, sustain and comfort the Queen, the Grand Duke, and all the Royal family, in this present time of affliction.

Signed and sealed, on behalf of the Council and the general body of Members of the Royal Institute of British Architects. CHARLES BARRY, President."

The Secretary also read the letter of condolence which had been sent to the widow of the late Mr. F. P. Cockerell, Honorary Secretary, a post which, in the words of the letter, "he occupied during eight years with honour to himself and advantage to his colleagues."

The President said that many of the members would be aware that their friend Mr. Horace Jones recently left England for two or three months' change, and they would be glad to hear that there were strong grounds for hoping that his health, which had been almost completely broken down, would soon be entirely restored. Though absent from its meetings, he had not forgotten the Institute, and he had sent drawings of the remarkable bascule bridge which he had designed to cross the Thames below London Bridge; also an effigy of Temple Bar cast from the lead which came from its roof. It was possible, however, that in consequence of his illness, the paper which he had promised on "Electric Lighting" would not be read this session.

A short discussion, or conversation, rather, then took place on Captain Burton's paper on "Remains of Buildings in Midian."*

The President observed that the apology with which Capt. Burton had commenced his paper, on the ground that there was little to interest architects in the land of Midian, was quite

* *Builder*, vol. xxxvi., p. 1330.

unneeded, for the paper contained some most interesting particulars as to the remains of ancient buildings which he had discovered,—remains the existence of which set one conjecturing as to what the buildings were like originally. Indeed, the general information which the paper contained, putting aside altogether that which dealt with the remains of old buildings, was most interesting and valuable.

Professor Kerr said he should like to ask Capt. Burton whether, without going into details of archæological proof, he could say if it was his impression or belief that any of the remains he had met with in Midian were those of pre-Roman buildings?

Captain Burton said he had met with one ruin which was distinctly of the date of Herod Augustus, but most of the remains were in such a state that they might be of almost any age. The city of Madyan, mentioned by Ptolemy, and now in ruins, was built of alabaster, which had crumbled away and was of the consistency of salt. Amongst the coins he had found was a forged one (showing that there were "smashers" in those days) with a representation of an Athenian temple on one side. It was composed almost entirely of copper, with a thin coating of silver over it. Of course this forged coin, which dated about 300 B.C., might have been imported into Midian, but there was no reason for supposing so, as there were found in contiguity with it many coins of distinctly local origin, in which the figure of the owl still survived. He could scarcely form any idea of the original buildings. In the book of Numbers (xxxi. 10) mention was made of "cities" and "goodly castles" of Midian being burnt by the children of Israel. Almost all the tribes at present inhabiting the country were modern, and of Egyptian origin. It was a question hotly contested amongst German scholars whether the Nabathæans were not the original inhabitants of Babylon.

Professor Hayter Lewis asked Captain Burton whether he had met with any stone circles or dolmens in his travels through Midian.

Captain Burton replied that he had not met with any circles, though he had heard of the existence of a single dolmen,—a stone mounted upon three supports.

A vote of thanks having been accorded by acclamation to Captain Burton,

Mr. Thomas Verity's paper on "The Modern Restaurant" was read. Of this we give the substance on another page.

DEMOCRACY IN ART.

AT a meeting of the Royal Society of Literature, held on Wednesday evening, the 8th inst., at the Rooms, 4, St. Martin's-place, Mr. C. H. E. Carmichael read an important paper on "Rubens, and the Antwerp Art Congress." Mr. Charles Clarke, Q.C., was in the chair, and there was a good attendance.

Mr. Carmichael said,—When the City of Antwerp, for the second time within the same century, resolved to celebrate a festival in honour of her renowned citizen, Peter Paul Rubens, she threw herself into the work of rejoicing with an ardour that few great mercantile centres would display for such an object, and with a good taste that still fewer could rival. The great secret of the Rubens festival and Art Congress of 1877 seems to me to have been that the festival was everybody's festival, and that all ranks of Antwerp society, and even both the great parties which so sharply divide Belgian politics and Belgian society, united in showing their common respect for the memory of Rubens. How strong a hold that memory has on the Belgian mind nothing could more strikingly testify than this universality of celebration which was so characteristic of the centenary of 1877. That it should have been determined to make an art congress one of the leading features of the festival will be accepted as most suitable to the occasion. The success was due to the same widely-diffused energy, of which I have already spoken. Taken up heartily by the highest office-bearers in the municipality, under the presidency of the over-worked but ever courteous Burgomaster of Antwerp, M. Leopold de Wael, and the able chairmanship of M. Picher, the Antwerp Art Congress played a conspicuous part in the more serious features of the Rubens centenary.

Having given an account of the composition of the Antwerp Art Congress, which included the names of well-known Continental artists, Mr. Carmichael continued:—I have been thus particular in giving these names in order that those of us who did not follow its proceedings at the time may form their judgment as to the general calibre of its members. I cannot attempt to carry you with me through all the manifold details of the discussions of even one section, but must content myself with dwelling upon some of the more widely interesting general features of the Congress and Festival. We discussed Rubens from pretty nearly every possible point of view, and tried to get some light thrown upon every kind of influence that he exercised over his contemporaries, and that his contemporaries exercised over him. How far we succeeded is a question which, I think, cannot yet be fully answered, for the after-results of such discussions are slow in developing themselves, and the influence of the mere fact of such a gathering for such an object is not to be measured by the number or quality of the papers read or opinions sustained. I incline to the belief that the questions proposed on such occasions, and circulated throughout the length and breadth of the literary and artistic world, produce an effect in stimulating research and quickening thought of which the full power will only be known perhaps in aftertimes, when research shall have resulted in the acknowledgment of facts hitherto ignored, or in the setting of well-known facts in a new light, and when thought shall have been quickened into action. No one, I think, can study the heads of discussion proposed at Antwerp in 1877 without feeling that, although on many points no satisfactory solution could be expected during the sittings of the congress, much would be gained by the very clash of opinion, and still more by their free and temperate expression. Questions which to the British mind are apt to appear unpractical may have, it seems to me, a very practical value in countries whose Parliamentary institutions are still in their infancy, but whose people prize the constitutional liberties which they themselves, or their fathers, have not long won. When such a people discuss the influence of "Democracy in Art," ancient Greece and Mediæval Italy seem to enter the lists, and modern Belgium seems to become more the "cockpit of Europe"; but this time the strife, though keen, is conducted, in regard to a tournament, where the object is to unhorse, not to slay, the opposing knight.

It may serve as some illustration of the general character of the discussion on the questions of the day which entered into the programme of the Antwerp Congress if I give a few extracts from the debates on "The Influence of Democracy in Art," for here, if anywhere, was the rock upon which the Congress might be expected to split. I do not mean to deny that a greater amount of warmth characterised these sittings than some others in which the topics were less exciting; but it is, I think, only just to Belgium to state that the discussion was opened by an Antwerp art professor, M. Van der Bussche, in very temperate language, and that one of the representatives, of what might be called the authoritative or aristocratic, as opposed to the democratic theory, Herr Schœfmann, admitted that if by the democracy was meant the whole people, in all the various manifestations of national life, he was ready to acknowledge the influence of democracy in art, for art, he said, "springs from the people, and belongs to their whole life." Yet this was the language held by one who professed to believe that the artist is "by nature aristocratic, and inclined towards authority." M. Van der Bussche, in his opening speech, gave a brief glance,—very necessary to the true understanding of the question under discussion,—at the various meanings of the word "democracy." It were much to be wished that one of our most recent English writers on this thorny subject, Sir T. Erskine May, had always kept these various meanings in view in the course of his elaborate work on "Democracy in Europe." Now it is evidently true, as M. Van der Bussche observed, that democracy in the ancient world was a different thing from modern democracy, and it is further true that Greek democracy differed from that of Rome. Yet, again, Mediæval democracy differed alike from its predecessors, and in the present day American democracy is widely different from that which manifests itself on the Continent of Europe, under varied forms, which are the outcome of European society and a European past. According to the view of M. Van der Bussche, art should be a beacon, lighting the way of the nations, and it ought, therefore, to guide democracy, not to be guided by it. This may appear to some to be a compromise between the two views of art; if so, it is, at any rate to my mind, a compromise embodying, and not giving up, truth. It is also perfectly reconcilable with the view of Dr. Scharpurans, for that which, he maintained, springs from the people, and is an integral part of their life in all its various manifestations, is scarcely best fitted to be unto the people as a beacon, lighting the way of the nations. In this manner we may, I think, harmonise the seemingly conflicting theories upon the influence of democracy in art, without giving up anything which is essential. And it seems to me that there was enough truth on both sides for the members of the æsthetic section of the Antwerp Congress to be able to separate, as they did, with their friendly feelings towards each other increased rather than diminished.

But it must not be supposed that the Congress only treated questions of theory. Not to speak of the Legislative Section, which discussed the possibility of framing an international art copyright law, and the basis of whose discussions was, to my mind, more practical than that adopted by some more recent congresses, the labours of the Historical Section deserve our attention, the question before it being, "What elements do we possess for a history of the works of Rubens?" The section came to the conclusion that these elements, which were numerous, but scattered over Europe, ought to be brought together and published in a collective form, and edited by a committee to be named by the authorities, under the appropriate title of "Codex Diplomaticus Rubenianus." It is proposed that the volumes constituting this "Codex" should embrace all official, notarial, and other documents, registers, &c., illustrating the history of Rubens, as well as a complete collection of his correspondence, comprising letters addressed to him, no less than those written by him; biographies, when founded on official documents, and drawn up not more than a century after his death; extracts from contemporary historians and chronicles; and, generally, everything that may seem likely to throw a light upon the life and works of Rubens. This is, it will be seen, both a comprehensive and a practical scheme. It is one which, in this Society at least, must meet with well-wishers, as offering the promise of a substantial addition to the literary history of art, in the full story of a great artist who was widely known and highly esteemed in England. It is quite probable that not only our State Paper Office, but also private collections, may contain some documents which ought to find a place in this proposed publication; and we may well believe that the town of Antwerp, which received its English visitors with such hearty, as well as magnificent, hospitality, would appreciate a return which should take the shape of assistance in the illustration of her great citizen. I should, for my own part, gladly receive and transmit to Antwerp any information, whether from public or private sources, tending to aid the Antwerp committee in making the proposed work worthy of the occasion which gave rise to it. We may be quite sure that the city of the Plantin Press will do all honour to its typographical no less than to its other artistic memorials. In the wonderful procession which wended its way by torchlight, as well as by sunlight, through the picturesque streets of old Antwerp, and down the broad boulevards of modern Antwerp, the printing-press of the famous house of Plantin had its place along with the principal works of Rubens.

My necessarily brief and imperfect sketch of the Rubens festival of 1877 would be still more imperfect than it is were I not to lay before you some of the interesting eulogies passed on the great Flemish master by the foreign representatives of the world of art, who came to do his memory honour in his own city. Conspicuous among these must stand out the carefully-weighed judgment of the veteran M. Charles Blanc, of the Institute of France, who, standing by the newly unveiled bust of Rubens, in the Hall of the Museum, spoke to this effect:—"Like a musician showing his superiority alike in the invention of a theme, in its composition, in its rendering on the stage, and in its vocalisation, Rubens is at once an admirable composer, and the most brilliant *virtuosi*. One of the things most astonishing to the æsthetical sense is that the Low Countries, the most distant

province of the empire of art, the furthest from its first home, should have seen the birth of the great painters who were to carry eloquence of colouring and *chiaroscuro* to their highest pitch. Far from imitating the French artists of the fifteenth century, who owed nothing to foreign influence, Rubens went abroad to seek inspiration and ideas." . . . . . .

It was through studying Titian and Veronese in Venice, and the Sistine Chapel in Rome, that he was enabled to see everything, even colouring on a great scale. It is because Rubens never became simply local in his art conceptions that he has given strangers a right to come and take part in a festival to which his spirit of universality seemed to invite them. The delegate of the Royal Academy of Fine Arts at Stockholm, said :—"Every Swede who has learned to read has also learned to venerate the name of Rubens, and to know something of his titles to renown, if only in the shape of the ten or twelve masterpieces which we are proud to possess from the brush of an artist who was the living embodiment of the art of an epoch at once brilliant and militant, and whose name is one of the privileged band of names that light up the darkness of the ages." Rhetoric paid its tribute to the language I have cited. Painting, engraving, photography contributed their share in the interesting specimens of Rubens and other masters, and reproductions of the works of Rubens in the galleries of Germany, Italy, Spain, and other countries, gathered together in Antwerp during the festival. That music, too, had her part, and that no unimportant one, in the glorification of Rubens, is a fact which I must not omit to commemorate, and those who heard the "Rubens Cantata" are not likely to forget the music played in the Rubens Tercentenary of 1877.

A brief discussion followed in which the chairman, Mr. Highton and Mr. Vaux took part, and the proceedings terminated with a vote of thanks to Mr. Carmichael for his paper.

TAMPERING WITH REPORTS: COST OF GRANITE PAVING.

SIR,—Will you permit me, through your columns, to call the attention of borough engineers and town surveyors to a disingenuous attempt to mislead them, which has been made by the Nevin Granite Company, Leadenhall-street, London ?

About eighteen months ago I was desired to report upon the suitability of several classes of stone for paving purposes in the borough of Bradford. Amongst these happened to be some Penmaenmawr or blue Welsh, respecting which great complaints had been made. A copy of my report the Nevin Granite Company have somehow obtained, and it appears to have occurred to them that it would be exceedingly smart were they to take a few words here and there from the report, and put them together in such a fashion as to make me give a favourable account of a paving material I had distinctly condemned, and transfer this to the granite they supply. That they have done this deliberately, and with full knowledge of what they were doing, is apparent from the fact that they pass over half a page of my report condemnatory of the Penmaenmawr stone, and pick out the concluding half of a sentence, the beginning of which did not suit their purpose, and use it to give a false colour to the statistics which were appended to my report.

I send, for the comparison of your readers, that part of my report from which the quotations are taken, and the statement in the Nevin Company's circular. Such a mode as they have adopted of puffing their granite seems to me to merit strong condemnation. If official reports are to be tampered with in this manner for advertising purposes, injustice will be done to the reputation of those whose duties are already sufficiently arduous, and there will be no reliance to be placed upon even the most positive statements put forward by those interested in the supply of any particular material.

The following is the passage in my report :—

"It is now upwards of twelve years since you commenced to pave with granite, and during that time five varieties of granite have been tried; they are :—

1. Penmaenmawr, or blue Welsh. 2. Mountsorrel. 3. Dalbeattie. 4. Shap. 5. Random.

No. 1 is the 3 in. by 5½ in. Penmaenmawr, or blue Welsh sett, as laid down in Thornton-road, Tyrrel-street, and part of Market-street. This is by far the most durable stone of any in use here, but from its extreme hardness, it is liable to become slippery, and forms an exceedingly dangerous pavement, and one not suitable for use as a paving material. Some of this stone has been laid down about twelve years, and I am unable to detect that it is yet worn to any appreciable degree.

I may, however, state that the quality of the Welsh granite laid down in Bradford is not that which is best adapted for paving purposes. A quantity of this granite, which was laid down for crossings a few years ago, has recently had to be taken up; and in the course of some correspondence with the company supplying it, I was informed that the stone was supplied as channel runners,—not as crossing stones. This must not be regarded as a fair sample of Welsh granite, for an abundant supply can be obtained out of the grey rock, equal to the Mountsorrel and Dalbeattie granite, both as respects security of foothold, cost, and durability. Large quantities of this grey granite are being used in Manchester and Liverpool, where it gives great satisfaction."

What the Nevin Company's circular makes of this is,—

"The following extract from a special report upon the subject of granite paving made by the borough surveyor of Bradford, Yorkshire, at the request of the street and drainage committee, shows the relative value of Welsh granite, as compared with some other descriptions used for paving in that borough. The surveyor's experiments and calculations are based on a period of twenty-five years, and an area of 7,000 superficial yards.

In reference to the Welsh granite he says, 'an abundant supply can be obtained out of the grey rock equal to Mountsorrel and Dalbeattie granite, both as respects security of foothold, cost, and durability. Large quantities of this grey granite are being used in Manchester and Liverpool, where it gives great satisfaction.'

The following table is the result of the experiments referred to :—

A TABLE showing First Cost of the different Kinds of Paving laid down in the Borough (exclusive of Foundations), with Repairs, Interest, &c., based on a Period of Twenty-five Years, and an Area of 7,000 superficial Yards, in Manchester-road, from Tyrrel-street to Mill-lane.

Materials.	First Life in Years.	Area in Superficial Yards.	First Cost. Price per Yard.	First Cost. £. s. d.	First Cost. To end of Years.	1st Repair, including waste. Price per Yard.	1st Repair, including waste. £. s. d.	1st Repair, including waste. To end of Years.	1st Renewals. £. s. d.	1st Renewals. To end of Years.	2nd Repairs, including waste. £. s. d.	2nd Repairs, including waste. To end of Years.	2nd Renewals. £. s. d.	2nd Renewals. To end of Years.	3rd Repairs, including waste. £. s. d.	3rd Repairs, including waste. To end of 25 Years.	Interest at 4 per cent. £. s. d.	Total Cost at the end of 25 Years. £. s. d.
Yorkshire Setts.....	8	7000	4/11	1720 16 8	5	2/7	904 3 4	8	1720 16 8	13	904 3 4	16	1720 19 8	21	904 3 4	25	4812 0 0	12,687 0 0
Random Granite	10	7000	5/0	1750 0 0	6	2/-	700 0 0	10	1750 0 0	15	710 0 0	20	1750 0 0	...	.....	25	3990 0 0	10,640 0 0
Shap Granite	9	7000	9/6	3325 0 0	6	3/3	1137 10 0	9	3325 0 0	15	1137 10 0	18	3325 0 0	...	.....	25	7703 10 0	19,953 10 0
							Repairs over half the area											
Welsh Granite	40	7000	11/0	3850 0 0	12	2/-	350 0 0	...	.....	...	.....	...	.....	...	.....	25	4632 0 0	8,232 0 0
Dalbeattie Granite ...	18	7000	10/6	3675 0 0	9	2/6	437 10 0	18	1699 6 1 Proportion for 7 years.	...	.....	...	.....	...	.....	25	3955 0 0	9,666 16 1
Mountsorrel Granite .	25	7000	12/0	4200 0 0	9	2/0	350 0 0	...	.....	...	.....	...	.....	...	.....	25	4424 0 0	8,974 0 0

They give the following statistics, and say :—

"From this table it will be seen that Welsh granite setts, over an equal given area,—

	£	s.	d.	
Last 15 years longer than Mountsorrel granite, and cost	742	0	0	less.
Last 22 years longer than Dalbeattie granite, and cost	1,434	16	1	„
Last 30 years longer than Random granite, and cost	2,408	0	0	„
Last 31 years longer than Shap granite, and cost	11,721	10	0	„
Last 32 years longer than Yorkshire setts and cost	4,455	0	0	„

The Nevin Company thus appropriate to the grey granite the character for durability I had given to the Penmaenmawr or blue Welsh, and after I had said (on their own representation) that Welsh grey granite was equal in respect of security of foothold, cost, and durability to Mountsorrel and Dalbeattie, they make me give statistics showing that it is both cheaper and more durable than these. They may say that they find the words "Welsh granite" in the table, but the heading of the table which they quote states expressely that it refers to "the different kinds of paving laid down in the borough." I may here state that when my report was written, not a single stone of grey granite had been used in Bradford, and on the page of the report from which they quote their introductory misleading half-sentence, it is set forth with a prominence that precludes mistake, that the only Welsh stone laid down in Bradford was the Penmaenmawr or blue Welsh; the first sentence of the paragraph from which they take their quotation expressly calls attention to the fact.

The designation "Welsh granite," I may say, was used because the Penmaenmawr stone was known by that name to the council and the public. The Nevin Company thus represent me as giving the preference to the material I have condemned.

JNO. ALLISON, A.I.C.E.,
Borough Surveyor, Bradford.

LEAD POISONING AT PORTSMOUTH.

STAFF-SURGEON C. J. FENWELL, of Portsmouth Dockyard, having reported to Rear-Admiral Foley, the admiral-superintendent, that during the past year there had been no fewer than seventy-five serious cases of lead poisoning in the yard among men engaged in cleaning the double bottoms of men-of-war, exclusive of the number of cases that occurred in the Indian troopers, experiments have been made upon the double bottom of the *Devastation*, with the object of ascertaining whether the processes now in use of chipping and cleaning the old red lead could not be dispensed with. The experiments have been conducted by Mr. W. B. Robinson, chief constructor; Mr. J. Elliot, constructor in charge of the ship; and Mr. Weston, admiralty chemist. Hitherto the most stringent regulations have been issued for the information of the workmen, but without effect, owing, no doubt, in a great measure to the difficulty in carrying them out practically. To preserve the iron of the double bottoms from deteriorating, the iron surfaces are coated with red lead, which requires to be periodically renewed. But before this can be done the old coating has to be removed, which can only be accomplished by chipping and scraping, whereby the poisonous pigment, converted into an impalpable powder, is inhaled by the workmen. To prevent the serious results of lead poisoning, and the introduction of the dust into the skin, the utmost attention to cleanliness is necessary. The shipwrights are accordingly advised to wash the face and hands, rinse the mouth, and comb the hair several times a day. Bathing and ablution of the whole body should also be frequently practised. The working clothes, which should be made of canvas instead of woollen material, should be washed at least once a week, and worn as little as possible after coming out of the ship; while the head should be protected by a cap made of some impervious substance, such as oiled paper. Care should be taken that none of the poison be admitted into the system with the food. The workmen are cautioned against taking their meals where scaling has been going on, and are advised to be scrupulous in cleaning their hands and lips before eating. They are also requested to use muslin covers for their mouths, to take plenty of fat or oily food at meals, and to use a sulphuric acid orangeade as a beverage. The impracticable nature of many of these regulations has led to their being generally neglected, with the consequences already mentioned. The first experiment on board the *Devastation* was

with a view to determining whether the old red lead could not be removed without the necessity of being chipped off, and it was found that the ordinary "cleansing powder" used in the yard, mixed with sea water, and applied with a brush, softened the lead to such an extent that it could readily be scraped off, like moistened putty, without any portion being dispersed in the form of powder. The subsequent experiments were made with the purpose of discovering whether red-lead paint could not be superseded as a protective for the iron by a non-poisonous composition. The requirements to be met were that the new protection should not be rendered inoperative by wet surfaces, and that it should dry almost immediately. These requirements were (according to the *Morning Post*) successfully fulfilled by a treatment of Major Crease's, of the Royal Marine artillery. A black composition is first applied to the iron, and, being a water paint, it is not affected by wet, after which a coat of specially-prepared cement is put on, which combines with the composition and forms a stony enamel, which effectually secures the double bottom from oxydisation. It was found that the coating dried in four hours, and it is understood that the cost is less than that of the poisonous process which has been hitherto adopted. The constructive department at Portsmouth has strongly recommended the new treatment to the Admiralty.

IMPROVEMENTS IN STREET GAS-LIGHTING.

EVEN though the electric light should fall short of the expectations of Mr. Edison, M. Jablochkoff, and the other gentlemen whose names have recently been prominent in connexion with that brilliant but (at present) costly and not absolutely reliable luminary, it will be remembered with gratitude if it should be the means of bringing about the greatly-needed improvement of our street gas-lighting. "Lighting," indeed, it can scarcely be called, for, with the exception of a few favoured streets in the City and at the West End, the street gaslights of the metropolis have hitherto been so feeble and flickering, and so few and far-between, that they have only served to make darkness visible.

The Phœnix Gas Company is, with commendable enterprise, now engaged in showing what *can* be done with gas-light. During the last few days Mr. Corbet Woodall, the company's engineer, has completely revolutionised the lighting of that portion of the Waterloo Bridge-road which lies between the foot of the bridge and the South-Western Railway Terminus. Up to the time the company took the matter in hand this stretch of road had been illuminated by twenty-two gas-lamps, including six at York-road crossing. The total light thus afforded was equal to about 264 candles, and the total cost per annum to 93*l.* 10s., or 5¼d. per hour. The first step was to remove the old lamps and to replace them by forty-eight others of new design, each giving a light of fifteen candles, as against that of twelve candles as previously, and the distance between the lamps being reduced to one-third of the former distance. The lamp-posts are about 2 ft. shorter than those usually employed, thus bringing the light nearer the ground, while the lanterns are somewhat of a diamond shape in vertical section, flattened at the top in some cases and at the bottom in others. Some are octagonal, while others,—the large ones,—are twelve-sided, and in all cases the iron frame in which the lantern is usually carried has been abolished, thus removing one cause of shadow on the pavement. The tops of the lanterns are glazed with opal glass, which reflects a much larger proportion of light on to the pavement than is usual. With those lanterns which are flattened at the top a shadow is cast from the under framing on the pavement, while from those with the flat-angled bottoms there is no shadow whatever. At the York-road crossing are two refuges, which previously were lighted from two posts, each carrying three ordinary gas-lamps. These latter have been removed, and replaced by single lanterns with opal glass tops and twelve sides, within which are burners giving a light of 130 candles in one case and 200 candles in the other. At each of the four corners of the intersecting roads is a lamp having an argand burner of 50-candle power, affording, with the large burners on the refuges, a high amount of illumination. At the end of the road next the bridge the old lamp-posts, being placed at distances of 40 yards apart, have not been removed, but have been fitted with argand burners of 50-candle power. The burners used have been made by Mr. William Sugg, of Westminster.

Of course, the cost of the improved system shows a considerable increase as against the previous defective method of lighting. The cost of the posts, lanterns, burners, and fixing is put at 120*l.*,—the yearly interest on the first cost, at 10 per cent. representing, therefore, 12*l.* The cost of lighting, cleaning, repairing, &c., is placed at 15s. per lamp per annum, that being the price paid to the company, and which equals 40*l.* 10s. The cost of the gas consumed in the 4,200 hours during which the lamps are alight in the year is put at 334*l.* 12s., the price of gas being taken at 3s. 4d. per 1,000 cubic feet, thus bringing the total cost per annum to 387*l.* 2s. Put in other terms, this means that the cost of gas used in thoroughly lighting 500 yards of broad roadway amounts to 1s. 7d., and the total cost, including maintenance, to 1s. 10d., per hour. Such a light as is produced is not required all the night through. In order, therefore, to economise, it is proposed to extinguish one-half the lamps at midnight, which would reduce the cost to 1s. 2d. and 1s. 5d. respectively.

The Phœnix Gas Company has succeeded in demonstrating,—what no one ever doubted,—that street gas-lighting in London is capable of great improvement. Should the electric light fulfil the most sanguine expectations that have been formed of it, the gas companies may possibly find it to their advantage to greatly improve our street-lighting without material increase of charge. In other words, their shareholders would, it is to be presumed, rather have their dividends reduced from ten per cent. to six per cent. than be placed in the forlorn position of receiving no dividend at all.

MASTERS AND MEN.

The Building Trade in Great Britain.—Mr. W. Knox, secretary of the National Association of Master Builders of Great Britain, has just issued two tabular statements, one purporting to show the state of trade and the labour-market at the commencement of the current year, the other giving the hours worked per week, and the wages paid per hour, in the building trade all over the country. From the first of these documents we gather that the building trade is, taken as a whole, in a very depressed condition. The table deals with seventy-three towns (excluding six which have not made any return since July last), and of these, only one (Guildford) reports trade as "very fair" in all branches, with a "sufficient" supply of labour. Portsmouth reports trade "good" in all branches, with a "plentiful" supply of labour (except in regard to painters and plasterers, the supply of painters being described as "moderate," while plasterers are "scarce"). A few towns report trade as "fair," and one or two as "moderate" and "middling"; the other towns variously report trade as "quiet," "very quiet," "slack," "very slack," "dull," "very dull," "bad," "very bad," "depressed," and "very depressed." This depression seems to be felt in most branches of the trade, and the supply of labour is almost invariably reported to be "plentiful" or "abundant" in all branches, Birmingham and Chatham reporting labour in all trades to be "largely in excess of demand." In twenty-nine towns the men in from one to four branches of trade are under notice from the masters, both in respect of reduction of wages and increase of hours. From the table stating the hours worked per week in summer and winter in the various trades, and the wages paid per hour or per week, we learn that longer hours are worked in Canterbury than in either of the seventy-eight other towns mentioned, the working hours in the cathedral city being 70 in all trades in summer, while in winter masons work 60 hours, bricklayers 54, carpenters 60, plasterers 60, slaters 60, plumbers 60, painters 54, masons' labourers 60, bricklayers' labourers 54, and plasterers' labourers 60. The wages paid in Canterbury, summer and winter alike, are 6½d. per hour to masons, 6d. and 6½d. to bricklayers, 6d. to 6½d. to carpenters, 7½d. to plasterers, 6d. to slaters, 6½d. to plumbers, 5½d. to painters, 4d. to masons' labourers, 3½d. to bricklayers' labourers, and 4d. to plasterers' labourers. In Blackburn, the hours of work and rate of wages in winter and summer are as follow:—Masons, 49 hours and 36s. per week in summer, 44 hours and 33s. per week in winter; bricklayers, 49 hours and 39s. per week in summer, 44 hours and 36s. per week in winter; carpenters, 49 hours per week, and 8½d. per hour, winter and summer; plasterers, 49 hours and 36s. per week in summer, 44 hours and 33s. per week in winter; slaters, 49 hours and 36s. per week in summer, 44 hours and 33s. per week in winter; plumbers, 49 hours per week, and 8½d. per hour, winter and summer; painters, 54 hours in summer, and 46½ hours in winter, 8½d. an hour all the year round; masons' labourers, 49 hours and 22s. per week in summer, 44 hours and 20s. per week in winter; bricklayers' labourers, 49 hours and 26s. per week in summer, 44 hours and 24s. per week in winter; and plasterers' labourers, 49 hours and 26s. per week in summer, 44 hours and 24s. per week in winter. In Taunton the hours would seem to be 59½ all the year round, and wages would appear to be lower there than elsewhere, the following being the rates returned for all trades, both in summer and winter:—masons, 4½d. to 5d. per hour; bricklayers, 4½d. to 5d.; carpenters, 4½d. to 5d.; plasterers, 4½d. to 5d.; slaters, 4½d. to 5d.; plumbers, 5d. to 6d.; painters, 4d. to 5d.; masons' labourers, 4d.; bricklayers' labourers, 3d. to 4d.; plasterers' labourers, 3d. to 4d. Wages in London, Liverpool, Manchester, Bristol, and other large towns, are in most instances nearly, if not quite, 50 per cent. above those paid in Taunton, while the hours worked per week are from 5 to 10 less.

Banbury.—The carpenters and joiners of Banbury, after being on strike eight weeks, have agreed to resume work at 1d. per hour reduction on their former rate of wages. The wages of the town will now be 6½d. per hour.

Perth.—The Perth masons have received notice of a further reduction of ½d. per hour.

WORKMEN IN LINCOLN.

A FEW weeks ago it was arranged amongst the builders of this city, in consequence of trade being very slack and, comparatively speaking, nothing doing, to have the men on short time so that we should be able to give them a chance of keeping their homes together until trade revived again. The joiners, carpenters, plumbers, painters, in fact, all the branches in connexion with the building trade, are quite agreeable to the arrangement, with the exception of the bricklayers, who protested against it, and told us distinctly, if you have not work enough to keep us all on full time you must discharge the men, according to the work you have, to keep the remainder full time, and unless you comply with our request we shall call all the men out on strike. The consequence is they have gone out on strike, as the masters do not intend to give way to them.

WILLIAM SIMS.

HALIFAX SCHOOL OF ART.

CHANGES AT SOUTH KENSINGTON.

THE head-master of this school, Mr. W. H. Stopford, in his recent report, objects strongly to the withdrawal of third-grade prizes, the only awards made to the elementary stages of instruction:—"In order to produce good advanced students, we must, in the first place," he says, "have good elementary students; and it appears to me, if the present system be persisted in, it is likely to produce an injurious effect, by unduly stimulating students to produce advanced works. Under the old system, medals and prizes were awarded to outline and shaded drawings from the flat; now it is very rarely that a shaded drawing receives a prize; and I have not heard of an instance in which an award has been made to an outline drawing. Again, in the annual exhibition of the National Competition Works at South Kensington, the elementary stages are now altogether unrepresented. In any sweeping measure, such as the reduction in the number of these third-grade prizes, due notice of the change should be given to masters, so that they should not lead their students to suppose they were competing for prizes which had been withdrawn. Another matter of much importance in our schools is the very desirable change which has been introduced under the new *régime* at South Kensington, viz.:—the use of the stump instead of the crayon-point in shading. In this instance, again, no official notice was given to art-masters of the transition. Last year we sent from this school one of the most beautiful shaded drawings of a column which I have ever seen; under the old system it would undoubtedly have received a high award, but owing to the change in treatment, of which we had received no notice, it obtained no recognition whatever."

Mr. Stopford again justly protests against the wretched accommodation and appliances at their disposal in Halifax.

CASES UNDER THE METROPOLITAN BUILDING ACT.

Dangerous Buildings. — At the Marylebone Police-court, Mr. Napier, from the office of the Metropolitan Board of Works, applied for an order under the following circumstances:—Mr. Alfred Bovill, district surveyor for the northern division of St. Pancras, he observed, had given a certificate that the College Laundry, College-lane, Highgate, was in a dangerous state, and it was necessary that an order of a magistrate should be obtained for the removal of the inmates. The application was made under the Act 18 & 19 Vict., cap. 122 (the Metropolitan Buildings Act), sec. 80, and which enacted as follows:—

"In cases where a structure has been certified by a district surveyor, or such other surveyor as aforesaid, to be dangerous to its inmates, a justice of the peace may, if satisfied of the correctness of such certificate, upon the application of the said Board, by order under his hand, direct any inmates of such structure to be removed therefrom by a constable or other peace officer; and if they have no other abode, he may require them to be received into the workhouse established for the reception of the poor of the place in which such structure is situate."

Mr. Bovill, the district surveyor, having been sworn, said he had inspected the premises, and found them in a very dangerous state. Part of the roof had fallen in, and another part was in a very dangerous condtion. Fifteen laundry-women were employed there, and the freeholder was anxious that the inmates should be removed.

Mr. De Rutzen made an order on Mr. Bovill's certificate.

What is a Building?—At the Wandsworth Police Court, Mr. Sutton, a builder, of Upper Richmond-road, Putney, was summoned before Mr. Paget, by Mr. Field, the district surveyor, for not complying with the provisions of the Building Act. It appeared that the defendant had in his yard a temporary "lean-to" against a hay-loft and stable, with two sides open, and a post, covered with boards and a tarpaulin. A second building had been enclosed with bourds.

Mr. Jones, who appeared for the defendant, contended that the lean-to was not a building within the meaning of the Act.

Mr. Paget called for the Act, to ascertain the definition of a building.

Mr. Jones said there was no definition of a building in the Act. He produced a printed opinion of Mr. W. Cunningham Glen, the counsel, which had been taken by the Wimbledon Local Board, as to the meaning of a new building, stating that it was not possible to give an accurate legal definition of what is a new building.

Mr. Paget said he quite agreed with him. After reading further on the magistrate observed that Mr. Glen was of opinion that a wooden knife-house was not a building. The case before him (Mr. Paget) was much stronger. His opinion was that the "lean-to" was not a building.

With regard to the other building, Mr. Jones said it had existed for many years.

Mr. Paget made an order for it to be enclosed with brickwork or other incombustible material.

COSTLESS POWER.

SIR,—The first or leading article in your issue of the 28th ult. deals with this question in so practical a manner that but little more is needed to cause public bodies to think carefully before attempting to bring to life in this country a competition between water power and steam power for any purpose not requiring a combination of slow motion and concentrated power. To it I commend the attention of all those who, not having any technical knowledge of the subject, have caught at the ideas suggested by Messrs. Hodson's report. Mr. Matheson's illustration of the Schaffhausen and Zurich works, where the swift current of enormous and glacier-fed waters is, to a certain extent, utilised, is disposed of effectually. Touching Mr. Matheson's opinion as to the relative cost of water under corporations and under companies, it may be asked, Where is any difference to be found, and in what degree? Till these questions are answered, no further attention is needed upon this head.

It may be well, in passing, to advert to the subject of leakage in water-mains for one moment. The writer of the article is quite correct in his statements, but at the same time it is possible by testing the pipes and joints after laying, in the open trenches, before covering, to secure an immunity from leakage. I may refer those interested in this subject to the Minutes of the Institution of Civil Engineers, in which will be found, during the present year, a paper giving precise details of a complete system of town supply laid down in this manner.

Coming, now, to Messrs. Hodson's reply, it is only necessary for me to supplement my former questions,—still unanswered,—by one or two others arising out of their reply in the *Builder* for the 28th of December.

I asked for information as to the mode of utilising with equable power the waste water at the Loughborough reservoir. I am first told that a "practical engineer" knows perfectly well that from the advent of "the autumnal rains throughout the wet months, and until the commencement of the summer season," large volumes of water are usually, at present, allowed to run to waste.

Do these gentlemen know that there is not the least regularity in the rainfall of this country, even in the so-called "wet months"? Have they seen the tables furnished by Mr. Hawksley to the Royal Commission on Water-supply, 1867-8, showing the three months of maximum and minimum of rainfall at Redmires, in the Sheffield Waterworks catch-ground for thirty-three years? If so, they will know that in the three consecutive months of maximum rainfall, that of June occurs eight, that of July nine, and that of August fourteen times That in the three months' minimum, that of January occurs six, that of February fourteen, and that of March twenty times, the last being the month which, during the aforesaid period of thirty-three years, has most frequently been in the category of dry months. No practical illustration of the mode of utilisation is given, and we are left to conjecture. A storm of say 2 in. in forty-eight hours happens on the 16th of November, and is succeeded by three weeks of dry weather; supposing the reservoirs to be full, what becomes of the surplus? Supposing them to be down and able to hold the rainfall, where *is* the surplus?

Again, where are the great towns so badly engineered as to be provided with immense volumes of surplus water? Are they Manchester, Liverpool, Leeds, Bradford, Huddersfield, Halifax, Newcastle, Blackburn, or any of our great manufacturing centres, most of which have been, within a few years, applicants to Parliament for increased powers of supply, new catch-grounds, as well as reservoirs?

It seems that I was mistaken in supposing Messrs. Hodson to recommend the construction of new weirs or other works to rivers, and that their suggestion was simply to use the water of the wet periods now flowing off to waste. As a matter of fact, I had no such supposition, being well assured that very little consideration had been given to a most complicated and difficult subject. I asked how it was proposed to utilise the waste waters of the rivers, and now am told, by way of reply, no more than that they simply suggest the use of the "water of the wet periods which now flows off in waste"; and, further, that some of the mills on the Soar have sufficient pound-room to store the night water for the day's use, except in periods of drought.

True enough; but how utilise it, unless, indeed, it is proposed to enter into an agreement with the mill-owner, and at certain hours, *varying every day*, stop his works, taking his power and using it for light, needed in the depth of winter at 3·45, and at midsummer not until nine o'clock, and also taking both the chances of drought and backwater.

Need more be said upon this chimera of costless power? M. PATERSON.

ORGANS IN CHURCHES.

SIR,—I am neither a church-builder nor an organ-builder, and, therefore, may be considered bold to write about a subject that I am not professionally acquainted with; but as I am a reader of yours, and derive great pleasure, as well as instruction, from the many practical hints contained in your valuable paper, it has struck me that I might be allowed to give a hint respecting the present mode of placing organs in churches, by which the mellowness of the tone is injured, and sometimes destroyed: I allude to the neglect of providing a recess for the organ, with a sufficiently elevated roof.

If you go into any ordinary modern Gothic church, you will usually find the organ crammed under one of the aisles, which, being a mere lean-to to the nave, has a comparatively low roof, while the organ itself is reared within a foot or two of it. Now sound, to be heard to advantage, wants room, and sound coming out of an organ so placed, vibrates against the roof, because it has no room, and produces a grating sound, which, in some instances, is so palpable as to interfere with the harmony. Almost any newly-built Gothic church will serve to illustrate my meaning. Go to St. Paul's, or the Abbey' or any *parish* church with an elevated roof, or to St. Stephen's, Walbrook, where, although the organ is near the roof, the sound has the dome to disperse in; or some of *Wren's* circular-roofed churches, where the organ has been placed on the ground-floor, and you will find that, though the value of the organ is no greater, the tone is softer and mellower, and has none of that grating vibration, which, to me, is (and I should imagine to musicians must be), offensive.

A LOVER OF CHURCH ORGANS.

*** The subject has been treated of in our our pages on more than one occasion.

THE INDUSTRIAL CRISIS.

SIR,—Your excellent article under this heading will be read at this season with much interest.

Let me, in a few words, give you a practical illustration of the cost of English and foreign labour; one instance only of many that have come under my personal observation. For some years I had, amongst others, a certain art-workman in my employ, whose rate of wages was 1s. 6d. per hour, together with an additional 6s. per week for lodgings whenever he happened to be working away from home. Further, he was accustomed to charge cab-fares, and other little items, that often tended to swell his "time-paper" considerably.

About twelve months ago I had occasion to dismiss him; and his place was soon afterwards refilled by a clever little Prussian from Westphalia. This man is content in receiving 9d. an hour and no "extras," whilst his work is quite equal to that of his predecessor's,—both as regards quality and quantity. Further, he (the Prussian) never goes off "*on the beer*"!

HARRY HEMS.

KITCHEN BOILER EXPLOSIONS.

SIR,—I am not inclined, without several experiments being made, to believe Mr. Lavington Fletcher when he states, as at p. 55, that a kitchen boiler red hot, or nearly so, will not burst with a sudden inrush of cold water into it. At present, I consider, such an assertion, if acted up to, is highly dangerous.

He is quite right, of course, about the gradual accumulation of pressure in a boiler with frozen-up pipes causing an explosion; and the stronger the boiler the greater the force of the explosion.

Mr. Fletcher, however, omits to explain the cause of the pipes freezing. I will, therefore, add that information. Two causes are—the pipes not being properly wrapped up with felt as they ought to be, and the ascending, or hot, pipe especially not having a gradual rise in every part of its course. When this latter is not seen to a cold-water trap is formed upon the ascension-pipe, and the easy rise upwards of the hot-water and steam prevented; hence, when the fire is low, or let out at night, a strong frost freezes the water in the trap, or past it, and an explosion takes place. A valve upon the boiler, if touched occasionally to see that it worked freely, would help to prevent accident; but the great matter is to put in the circulating-pipes properly, and protect them.

When the hot water stops running at the kitchen sink, that is a warning to look after the boiler. W. P. BUCHAN.

SIR,—I observe, in your impression of to-day, remarks made by Mr. Lavington Fletcher, which describe a safety-valve as the one security against kitchen-boiler explosions;—but what safety-valve? Daily attention, if I am rightly informed, is required by the safety-valves in use in the ordinary steam-engine boiler,—the result, I presume, of corrosion caused by their contact with steam. So vital, for safety, is this attention considered by a large engineering firm of my acquaintance, that one of the principals makes it part of his daily business to see this valve lifted. No one can expect such attention as this to a kitchen-boiler, where a safety-valve, to be a perfect security, must be reliable if left untouched for years; and to be an imperfect one must need examining at most at the commencement of each winter season. Some of my engineering friends tried to manufacture for themselves a valve which would satisfy these conditions, by the use of a meta which would melt at a certain temperature

but did not at the time succeed. May I, then supplement the remarks referred to by asking what valve we should use? HORACE FIELD.

OBITUARY.

Mr. E. M. Ward, R.A.—Thursday's evening papers announce that Mr. E. M. Ward, R.A., who had been for some days dangerously ill, died at his residence, Windsor, on Wednesday evening, at ten o'clock. He was born in 1816.

Lieut.-Colonel Vallancey.—The death of Lieut.-Colonel (G. P.) Vallancey, of her Majesty's Indian Army, at Guernsey, on the 16th ult., at the age of seventy-two, is curtly announced in the daily press. There are thousands to whom the thought will not occur that the deceased was the grandson of General Charles Vallancey, the once celebrated Irish antiquary, who died as far back as 1812 at an advanced age. A sketch of the life and works of the distinguished engineer and antiquary, who held an appointment under the Irish and United Government for many years, was given in our volume towards the close of 1869. The reproduction of that sketch in the Dublin press brought us a letter in January, 1870, revealing a number of facts not previously known respecting the antiquary and his family.

A Well-known Sanitary Reformer.—One of the best friends of sanitary reform in Liverpool died last week,—Mr. Hugh Shimmin, who was for many years past the editor and proprietor of a local paper called the *Liverpool Porcupine*, which prominently advocated the improvement of the sanitary condition of the town. In prosecuting this task the deceased undertook the arduous work of personally visiting the various fever and disease-breeding parts of the borough, and the ill-ventilated, dirty, and overcrowded abodes of the labouring population were from time to time unearthed in the columns of the *Porcupine*, until at length they attracted the serious attention of the health committee of the Corporation. On many occasions Mr. Shimmin accompanied the members and officers of the health committee on personal visits to the lower parts of the town, pointing out to them the unsanitary scenes which he had discovered, in the course of his explorations, and Mr. Newlands, the late borough engineer, as well as Dr. Trench, the late medical officer of health, and Mr. Shuttleworth, the late town clerk, have all frequently been heard to declare that the information furnished by Mr. Shimmin was most valuable, and that the town was deeply indebted to him.

THE BIRMINGHAM DISASTER.

A GREAT calamity occurred to Birmingham on Saturday last in the destruction by fire of the magnificent reference and lending libraries, including the famous Shakspeare library and the Cervantes collection. For some months past, the works in connexion with the extension of these libraries have been in progress, and as these involved the lengthening of the library-rooms, which were situated one over another, a boarded timber screen was erected at the end of each room to form an enclosure while the end wall was removed. This was canvassed and papered on the inside, and in the upper or reference library the book-cases were erected against this screen to nearly its full weight. A gallery ran entirely round this room, and it was lighted by ceiling-lights by day and sun gas-burners by night, the iron pipes to supply which were carried up temporarily outside the screen. The weather having been very cold lately, the gas in these outer pipes became condensed and frozen into ice, which checked the flow considerably. About 1 p.m. on Saturday, one of the gasfitters employed by the Gas Department of the Corporation was employed in thawing these pipes, which he unwisely attempted to do without removal, and with the gas full on in them. By some means not yet explained, some deal shavings which he had taken with him became ignited, and these set fire to the wooden partition, alarming the readers and attendants, who at once put into use a dozen buckets and a hogshead of water, standing ready near the door of the room, but without avail. They then turned their efforts towards securing as many of the books as possible, and succeeded in saving a large number. The fire, however, soon burnt through a wood-joisted pugged floor, into the room below, from which many of the books forming the lending-library had been removed, and in which stood the marble statue of the Prince Consort, and the very fine colossal statues, in plaster, of Burke and Goldsmith. It was at one time feared that these would be destroyed; but by great effort they were saved, and afterwards removed into the new borough offices.

The cold at the time of the fire was so intense that the fire-plugs were frozen, and much valuable time was lost in consequence at the outset, and afterwards, when an abundant supply of water was obtained from a special high-pressure main recently laid down, the water quickly froze on the charred embers, and embedded the ruins in a sheet of ice.

It is intended at once to begin the reconstruction, the means for which will be at once forthcoming, the building being insured in the Lancashire fire-office for 12,000*l.*, and the books, &c. for another 12,000*l.*, which will doubtless buy a great many books, but not enough, and a further sum of 10,000*l.* is required to be raised by subscription, towards which the sum of 2,750*l.*, in six donations, is already secured. The disaster is, nevertheless, irreparable.

VENTILATION OF CHURCHES.

SIR,—We wish some of your correspondents would kindly state the best means of ventilating churches and chapels without the congregation feeling anything of down-draughts.

M. & S.

"BRICKS! BRICKS! BRICKS!"

SIR,—I should have been as glad as "Old Subscriber" to purchase the "fifteen millions good Kent bricks" for cash, with guarantees to deliver to my order, of good quality, at the prices advertised.

I sent a clerk with my son to find the advertiser, at "Bath Buildings, Lothbury," with instructions not to come back till he was found. Had they obeyed me implicitly, it appears from "Old Subscriber's" letter in your issue of the 11th inst. I might never have seen them again.

I hope the advertiser will be discovered, or will discover himself, unless he prefers his action to be considered a discreditable hoax or a dishonourable trick.

WILLIAM THOMAS WISEMAN.

CHURCH-BUILDING NEWS.

Heigham.—The old parish church of Heigham, dedicated to St. Bartholomew, having undergone complete restoration and enlargement as a memorial to Bishop Hall, has been re-opened. Previously to its restoration the church consisted of a nave, south aisle, and a north porch; but an aisle has now been added on the north side. This aisle is in the Decorated style, with four bays and elaborate moulded arches, and an open-timbered roof. The whole fabric has been carefully restored. The south walls are preserved, and a new roof supplied to that aisle on exactly the same pattern as the one removed. A new porch has been erected on the north side, the tower has been refaced, and a new parapet given to it. The church is seated with open oak benches, and paved with Minton's encaustic tiles. The windows are glazed with cathedral glass, and the church is warmed with heating apparatus by Messrs. Barnards & Bishop. All the interesting mural monuments, including that to Bishop Hall, have been cleaned and removed from the north wall of the nave to the new aisle. A vestry and organ-chamber have been attached to the north aisle, and a new pulpit and communion-table provided. The restoration has been carried out from the plans of Mr. R. M. Phipson, Mr. G. E. Hawes being the contractor, and Mr. Owen clerk of the works. The gasfittings are by Mr. Palmer. The cost has been 2,500*l.*

Burton-Leonard.—We are requested by Mr. C. Hodgson Fowler, F.S.A., to say that the wood-carving at this church was done by Mr. Milburne, of York, as stated by us recently but that all the stone-carving was done by the builder's foreman, Mr. Watson.

SCHOOL BUILDING NEWS.

Torquay.—The new Wesleyan school premises in Lower Union-street, Torquay, were opened on the 17th ult. Adjoining the school there is being erected a Wesleyan Chapel. The total cost of the new premises will be about 6,000*l.* The actual amount of the contract is 5,773*l.* 10*s.* The chapel is to be completed by the end of March. The school will be used forthwith. The buildings have a frontage of 110 ft., and extend in depth to the Castle-road. The style of architecture adopted is Classic. The chapel, with its galleries, will hold over 1,000, and the school-room between 400 and 500. Bath stone is freely used in the front. The whole of the walls are built with local limestone, the portions seen from the street being of nobble work pointed in cement. The architect is Mr. J. W. Howell, Torquay, and the contractor is Mr. E. P. Bovey, Torquay. Mr. Hems, of Exeter, did the carving.

Gateshead.—On the 26th of December, the foundation-stone and four corner-stones of the Primitive Methodist new schools, Sunderland-road, Gateshead, were laid. The schools, with vestries, heating-chambers, &c., will cost, including the site, 900*l.* They will be built to accommodate 400 children. Mr. Thomas Southern, of South Shields, is the architect, the builder being Mr. Thomas H. Hutchinson, Gateshead.

Sevenoaks Weald.—A new infants' school, to accommodate eighty children, is being built in Sevenoaks Weald. The cost will be 320*l.*, without fittings. The contractors are Messrs. Punnett, of Tunbridge.

SCHOOL BOARD SCHOOLS.

Dewsbury.—The memorial-stone of new Board Schools at Eastborough, Dewsbury, has been laid. The schools are situated in a central position, with frontages to two streets. They are designed in the Geometrical Gothic style, with traceried windows and a tower about 100 ft. high. The schools will accommodate 900 children in three departments. The uneven state of the site presented some difficulty, but this has been overcome by making the schools partially two stories in height, so that the children accommodated on both stories will enter from the level of the street. The buildings are being carried ont under the superintendence of Messrs. Holtom & Connon, architects, at an estimated cost for schools and fittings of about 7,000*l.* They are being erected by local contractors.

Mexborough.—A new Board School for 200 children has been opened here. It is built of Mexborough stone, and occupies a site at the junction of Garden-street and Dolcliffe-road. Messrs. Tacon & Rawson, of Rotherham, were the architects, and Messrs. Saul & Jones, of Mexborough, the contractors. The total cost was 2,579*l.*

Bill Quay (Durham).—The second group of schools erected by the Heworth Board has been opened at Bill Quay. The new buildings will afford accommodation for 550 scholars, on the mixed principle. In their general arrangements these schools are somewhat similar to those lately opened at High Felling from the designs of the same architect. The ventilation is by means of vertical inlet tubes, opening into the rooms at about 6 ft. 6 in. from the floor, for the admission of fresh air, and by sheet-iron tubes above the ceilings for the extraction of vitiated air. The extract tubes are taken to central cylinders placed in turrets over the two main rooms, where provision is made by powerful Bunsen burners, lighted by electricity, for the rarefaction and expulsion of the vitiated air. The heating is effected by means of hot-water pipes and coils. Externally the schools, with the caretaker's house, are executed in red pressed bricks, with black brick bands, stone dressings, and slated roof. The contract has been efficiently carried out by Messrs. Carr, under the supervision of Mr. Lowes, the clerk of the works, at a total cost of about 5,500*l.* Messrs. Walker & Emley were the contractors for the warming and ventilation. Mr. Thomas Oliver, of Newcastle, was the architect.

Rathen.—New school buildings, provided by the School Board of Rathen, have been opened. The new buildings are on the site of the old school, and are fitted up with all modern requirements, having statutory accommodation for 230 scholars. The plans were by Messrs. Mackenzie & M'Millan, architects, Aberdeen; and the contractors for the buildings were:—Mr. Wm. Davidson, mason, New Pitsligo; Mr. R. Burgess, carpenter, Ellon; Mr. A. Wiseman, plasterer, Fraserburgh; Mr. Jos. Merson, slater; Mr. Jas. Reid, plumber, Fraserburgh; Mr. Alex. Smith, painter, Fraserburgh.

Balsall Heath.—The new Board school in Clifton-road, Balsall Heath, has been opened. It provides for 800 children. Mr. G. Ingall is the architect.

Chelsea.—Sir Charles Reed, chairman of the School Board for London, has opened the new schools which have been erected in Marlborough-road, Chelsea. The area of the ground covered amounts to 17,723 square feet, at an inclusive cost of 8,296*l.* The cost of building, exclusive of extras, amounts to 7,608*l.*; while the total cost per head is 30*l.* 1*s.* 5*d.* The new schools will accommodate 193 boys, 187 girls, and 152 infants. Mr. E. R. Robson is the architect.

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Termonfeckin.—A new church is about to be built at Termonfeckin, county Louth, which will replace the present thatched structure. An excellent site has been selected, and a large quantity of stone carted to the place. The parishioners have appointed a committee to whom was intrusted the duty of appointing an architect to draw up the plans of the new church. At a meeting of the committee the names of Mr. Ashlin, of Dublin, and of Mr. P. J. Dodd, Drogheda, were proposed for adoption. The majority decided in favour of Mr. Dodd.

Inchicore.—On the 8th ult., the new church of Mary Immaculate, Inchicore, was solemnly dedicated. The church comprises nave, transepts, chancel, and four side-chapels. The full length is about 158 ft., and the width across the nave and aisles is about 527 ft., the width across the transepts being some 76 ft. The chancel measures about 31 ft. long by 28 ft. wide, and the area of each side-chapel is 20 ft Polished columns of Aberdeen granite support the nave and aisles, and these columns are provided with white Portland stone moulded bases and capitals, the latter being richly carved. Similar arcading, but of somewhat lighter proportions, will divide the chancel and side-chapels. The aisles, each divided into six bays in length, are lighted by twelve three-light windows with traceried heads. The nave clearstory is subdivided into twelve bays, and on each side the windows will consist of two lights. On each side of the western gable are two turrets, measuring externally at the base about 16 ft. and providing accommodation for bells and ringing-chambers. The lower portion of each of these turrets serves as a porch to each of the aisles, and the upper portion of each is to be surmounted by a spire reaching 104 ft. from the ground to the base of the cross. The height from the ground to the apex of the nave gable is 70 ft., and the entire height from the floor to the ceiling is 55 ft. The general style of the design is that of the Decorated period of Gothic architecture, and the principal materials introduced in the construction are Dalkey granite, ashlar for the external facing, with Portland Stourton stone for the dressings, and internally both Portland and Caen stone are used. Mr. Ashlin is the architect.

VARIORUM.

THE new issue of Streets' "Indian and Colonial Mercantile Directory," 1879, gives the various steam routes to the places treated of, with rates of fares and times of transit; particulars of the various railways in operation or construction; and the London agents to each of the banks, so that a merchant is enabled to see to whom to apply, where financial information or assistance is needed in connexion with any particular town or city. Full particulars of the principal products are given, and articles which form the chief trade of each place, so that merchants can tell (guided by the Customs tariff given) the class of shipments likely to prove most remunerative. Another feature in the present edition is the insertion of maps of the various countries mentioned. The practical value of the book was shown to us forcibly by a coincidence. At the moment when it reached us a youngster in whom we are interested was urging his desire to go to our South African Colonies, to push his fortunes as an agriculturist or a trader. The book opened almost of itself at a map of them, and following it was such information as to such of the principal towns and their occupants as enabled us to arrive at once at a fairly reasonable opinion on the subject.——"Jenkinson's Practical Guide to North Wales" (Stanford) is a handy little book. This is not the time to pay a visit to Wales, be it North or South; but when the summer comes, and the air is ambient and the fingers are not frozen, as ours feel at this moment, such of our readers as desire to enjoy its many beauties may remember that Jenkinson's Guide will be useful. ——We have received from Messrs. Cassell & Co. the second volume of "A New Testament Commentary for English Readers," an important book for those who seek such instruction as it purports to convey. Edited by Dr. Ellicott, the Bishop of Gloucester and Bristol, with the collaboration of such men as Dr. Plumptre, Dr. Sanday, and the Rev. T. Teignmouth Shore, the book necessarily contains a large amount of learning and knowledge.

Miscellanea.

American *v.* English Locks.—Mr. James Hill, of Upper Thames-street, says, in a letter to Col. Wrottesley, published in the *Times*:—"With respect to my own particular trade, I used to buy the bulk of my locks from Willenhall. I am not exactly a manufacturer, although I have locks of my own patterns made exclusively for me. I prefer to be a merchant only, as I should be sorry to have direct dealings with the British workman. I still buy a little from Wolverhampton and Willenhall, when time is of consequence; but my chief supply comes now from America. I was driven there by the inferiority and high prices of English workmanship, and the unwillingness of the masters to entertain my ideas of improvement. The latter are now complaining of my American resources. . . . I have supplied all the locks for a large hospital at Walsall,—within a stone's throw of where locks are made! Yet these locks of mine came 3,500 miles, and cannot be equalled in this country. This is 'sending coals to Newcastle' with a vengeance! I have certainly reason to rejoice that I visited America last year. I opened up business relations with one or two large firms, who have taken pains and spared no expense to carry out my views in relation to much-needed improvements in the symmetry and construction of our English locks. . . . You ask me to state the results of my observations in America and the causes operating in favour of American productions being cheaper and better than the English. In the first place, the Americans certainly employ machinery a great deal more than we do. Indeed, the bulk of our English locks are hand-made, and there is too much of the 'rule of thumb' about them. Secondly, the Americans, both masters and men, seem to have more technical and general education than we can boast of here. We do not think enough in our manufactories, whereas it would pay us to keep a man to do nothing but invent and improve and think out the requirements of our customers. In the third place, the men work longer hours in America, and I was surprised to find that they worked as long on Saturdays as on other days. Fourthly, I found less drunkenness in America, and I certainly could not hear that the men neglected their work through drink. . . . . I have no great faith in the cheaper class of American locks. Some of them are really too cheap and too common for this country, and are only fit for the wooden houses in the States. I do not sell any of these pure 'Yankee' goods, and people have made a mistake in importing them so largely. What I have done is this (and I believe my idea was original), I got the Americans to improve upon the old recognised English patterns, so that my locks ought to be termed 'Anglo-Americans.'"

Electricity and Lightning.—Mr. Stephen Grey, a Charterhouse pensioner, who discovered the difference between conductors and non-conductors, and other capital facts, appears also to have been the first electrician who entertained the notion of an identity between electricity and lightning. In the concluding paragraph of one of Mr. Grey's papers printed in the "Transactions of the Royal Society," the author says, whilst contemplating the results of the experiments he had been describing in the same paper:—"By these experiments we see that an actual flame of fire, with an explosion, and an ebullition of cold water, may be produced by communicative electricity (communicated to a metallic rod, an iron ball, and other bodies, on which he had been experimenting); and though these effects are at present but in *minimus*, it is probable that in time there may be found out a method to collect a greater quantity of it, and, consequently, to increase the force of this electric fire, which, by several of these experiments, seems to be of the same nature as that of thunder and lightning." These predictions, which were printed in "Transactions for the Year 1735," ten years prior to the discovery of the Leyden Jar, and about seventeen before the first successful experiments in atmospherical electricity, were wonderfully verified in these two memorable events.—*The Electrician.*

Horsemonger-lane Gaol.—As will be seen by an advertisement which we publish this week, the materials of Horsemonger-lane Gaol are about to be sold by Messrs. Horne, Eversfield, & Co.

Thames Valley Drainage.—Mr. T. J. Nelson, presiding last week at a meeting of the Hampton-wick Local Board, drew attention to the notice sent out by the Lower Thames Valley Main Drainage Board, of which he is the chairman, inviting the opinions of the several constituent authorities with regard to separating rainfall from house sewage. He explained that the joint board was formed on the basis of its being obliged to provide for the drainage of the district to the extent of 250 gallons of sewage daily for every inhabited house. According to the scheme (Colonel Haywood's) which the Board had adopted, the first pumping-station would be in close contiguity to the gasworks at Richmond, and that would lift the sewage of Barnes, Kew, and Mortlake. Taking the rainfall at 25¼ in., the total per annum in tons which would come to the first pumping station would be 8,184,324, the number of feet which the pumps would have to lift was 24, and the cost of fuel for pumping 327*l.* a year. The sewage then flowed on to Ham Fields,—the second pumping-station. There, of course, would not only have to be lifted the sewage that had come down from Barnes, Kew, and Mortlake, but also the sewage of the very large district of Heston and Isleworth, Richmond, Petersham, Ham-court, Teddington, and Hampton Wick, and the rainfall for these additional places would be 29,189,364 tons, which would have to be lifted a height of 27 ft., and the cost of coals per annum would be 1,682*l.* Having got the sewage there it would then flow on in union with Kingston, Surbiton, New Malden, East Molesey, Long Ditton, Thames Ditton, Hook, Kingston-common, Esher, West Molesey, and Hampton, and the rainfall from the area would amount to 36,401,472 tons. If they added two other stations it would give a total of 73,775,169 tons of rainfall which would have to be pumped at the final place of irrigation area at Esher, the number of feet the pumps would have to lift it being 40, and the cost per annum for coals amounting to 4,918*l.* The total cost, therefore, of pumping the rain alone would amount to 6,927*l.* He urged that this was an expenditure that ought not to be incurred, as experience showed that in dealing with sewage it was best to have nothing to do with rainfall. The Board thereupon agreed to adopt the separate system as soon as the joint Board was prepared to receive their sewage.

Edinburgh Builders and the New Police Bill.—At a meeting of the Executive Committee of the Edinburgh Master Builders' Association, held on the 7th inst., the building clauses of the new Police Bill were considered. It was pointed out that the Town Council had not given effect to any of the builders' suggestions, except that of permitting the erection of saloons for business purposes behind tenements altered for such purposes, the provision, however, not extending to saloons in connexion with new buildings for business purposes. It was unanimously agreed to recommend the Association to take steps to oppose the passing of the Bill in the Committee of the House of Commons, or otherwise secure its amendment. Objection was also made to the extension of the Dean of Guild Court jurisdiction, on the ground that by the constitution of that body there was no guarantee that the Dean should have a practical knowledge of buildings; that eleven of a Court was too large; and that the proportion of three of the eleven to be architects, engineers, surveyors, or builders was too few. It was proposed to strike from the duties of Master of Works that of certifying new buildings or alterations to be "fit for occupation," retaining the clause, "is in accordance with the provisions of this Act," as being, in the opinion of the committee, sufficient to guarantee all necessary sanitary and other requirements. Certain minor clauses were also objected to, such as that requiring party-walls to be carried 2 ft. above the roof timbers, and that providing for the emptying of washhand basins and sinks over a trapped grating on the surface of the ground before passing into the drain. An amendment was proposed in the section imposing a penalty for refusing to weigh coal, so as to extend it to all other materials for sale in the city, and to provide that the purchaser have the power to insist upon weighing or re-weighing.

The "New Infirmary of St. Luke's," in the City-road.—Messrs. Guynan & Son supplied the whole of the blinds to the north block and the administrative offices.

Tramways in Newcastle-on-Tyne.—On the 23rd ult. a section of the tramways which have been laid down by the Corporation of Newcastle-on-Tyne was formally opened. The tramways have been leased by the Corporation to Messrs. William Turton, Leeds, Daniel Busby and William Busby, Liverpool, for twenty-one years, and the Corporation are to be paid as rent by the lessees 7½ per cent. on 30,000*l.*, the amount of capital authorised to be expended under the Parliamentary powers obtained by the Corporation, and the lessees have also to keep the roadway between the rails, and for a distance of 1 ft. 6 in. beyond the outer rails, in repair. The line is partly double and partly single, with passing points. The mode of construction is as follows:—The rails are of rolled steel 3 1-16 in. wide, and 2⅜ in. deep, with a groove ⅝ in. deep, and weigh 50 lb. to the yard. The rails are fixed on cast-iron chairs by means of hob-headed nails, similarly to folding wedges, through the sides of the rails into wooden plugs in the chairs. The points and crossings are also of steel. The rails are 24 ft. long, and bear on chairs placed 3 ft. centre to centre. The ends of the rails are fastened on to "joint chairs" in a similar manner to the single chairs, and have two pins driven into each side of the rails. The ordinary chairs weigh 48 lb. each, and the joint chairs 85 lb. each, and all are of Kincaid's patent. The gauge between the rails is 4 ft. 8½ in. The tramroads for the full width between the rails, and for a distance of 18 in. beyond the outer rails, are paved with whinstone where the gradients are easier than 1 in 40, and with Dalbeattie granite where the gradients are heavier than 1 in 40. The stones are dressed to 4½ in. by 4½ in., and 6 in. deep, and are laid as close as possible, and well rammed; and the joints are filled in with clean shingle, the whole run in with asphalte and boiling hot tar. All the work has been done by Mr. Simpson, contractor, under the direction and personal superintendence of Mr. Fowler, the borough engineer.

The Goldsmiths' Company and Technical Education.—With a view to the encouragement of technical education in the design and execution of works of art in the precious metals, the Goldsmiths' Company resolved some time ago to give valuable prizes for specimens of original work. These prizes have recently been awarded with the following result:—Mr. W. W. Morrison, for a design for a tea and coffee service, 50*l.*; Mr. A. Garbutt for a model for a shield, 50*l.*; Mr. H. E. Tidmarsh, for a design for a salver, 25*l.*; Mr. C. Vigor, for a model for a cup, 25*l.*; Mr. H. Simpkin, for execution, 25*l.*; Mr. A. Crichton, for execution, 50*l.*; Mr. W. Smith, for chasing, 25*l.*; Mr. T. Edwards, jun., for *repoussé* work, 25*l.*; Mr. J. S. Gill, for engraving, 25*l.*; Mr. G. W. Rhead, for a design for a wine-fountain, 25*l.* A selection of the best objects sent will be exhibited at the South Kensington Museum for about a month.—*City Press.*

A Turner.—The following odd story is current. Some twenty-five years ago John Butterton, a young English artist, went to Philadelphia with Turner's picture of "Conway Castle, North Wales." Mr. Thomas Moran, the well-known American painter, saw the picture, and has since remembered it with enthusiasm. He has traced the work to Hamminton, Atlantic County, New Jersey, and has purchased it from Mr. Butterton. It is now in Mr. Moran's studio at Newark, and is valued by art experts at from 5,000*l.* to 6,000*l.* The picture measures 3 ft. 8 in. by 4 ft. 8 in. It was painted about the year 1810 for Mr. Thomas Goodall, banker, of Abingdon, Berkshire, and went direct from Turner's studio to the owner's house. At the death of Mr. Goodall it came into the possession of the present Mr. Butterton's father, of Batacre Hall, Staffordshire, and when he died it was inherited by Mr. Butterton, of Hamminton.

"Dreadnought" Seamen's Hospital, Greenwich.—The Committee reported to the General Court of the Governors of this society, held on Friday in last week, that the whole of the sewers of the hospital had been ventilated and trapped under the direction of Mr. Ernest Turner upon a plan approved by Mr. Robert Rawlinson, C.B.

Institution of Surveyors.—At the ordinary general meeting, held on January 6, a paper on "Terminal Charges," by Mr. T. F. Hedley (supplementary to the paper read at the last meeting, on "The Rating of Railways"), was read, and the discussion on the two papers was adjourned until the next meeting, Jan. 30.

Drury-Lane Theatre.—In the afternoon of Thursday, January 23rd, will be produced Shakspeare's tragedy, "Romeo and Juliet," in which Miss Rosa Kenney, the daughter of Mr. Chas. Lamb Kenney, and grand-daughter of the even better known earlier dramatist of that name, will make her first appearance on any stage in the character of *Juliet*. There is a little romance in the matter. For several years, it seems, this young lady, without the knowledge of any person, has sedulously studied Shakspeare with a view to making her appearance at a fitting moment, and, if we may believe some good judges who have had an opportunity to estimate her powers, the stage will gain a valuable recruit.

Compensation Case.—Mr. Under-Sheriff Burchell presided over a special jury, on the 11th inst., at the Middlesex Sheriff's Court, in the case of Parry *v.* The Metropolitan District Railway (Fulham Extension). This was a compensation claim of 2,787*l.* for premises at Walham-green, and the loss of business as a cowkeeper by the railway taking his property. He had sold off his stock, and alleged that he could obtain no other premises in the neighbourhood. In addition to his leasehold interest he claimed 1,500*l.* for three years' profits. The jury, after consulting for half an hour, assessed the value at 1,200*l.* As this amount was under the offer made by the company it will not carry costs.

The Fall of Three Houses at Lewisham. At the Lewisham District Board of Works, Mr. Carline, the Board's surveyor, reported as to the three houses in course of erection in Hithergreen-lane, which had suddenly fallen. As already mentioned, the primary cause of the accident was the corner column giving way, and the houses having been built in frosty weather the mortar did not bind, and they fell like a pack of cards. Three houses adjoining have since been condemned by the district surveyor, and constables placed on the spot to warn people of danger.

Bristol and Gloucestershire Archæological Society.—A general meeting of this society will be held on Wednesday, February 5, at the School of Art, Gloucester. The following papers will be then read, and others are expected:—"St. Briavels Castle," Rev. W. Taprell Allen; "The Arms of the Free Miners and Free Smiths of the Forest," Mr. J. D. T. Niblett, F.S.A.; "Dukes of Gloucester," Rev. W. Bazeley; and "A Chapter in Gloucestershire History," Mr. J. H. Cooke, F.S.A.

Fall of Cornice.—The inhabitants of Seldon-road, Nunhead, were alarmed on Tuesday morning by a couple of loud crashes, resembling the falling in of a building, which, it was discovered, resulted from the precipitation of from 60 ft. to 70 ft. of the ornamental cement and brick coping from the top fronts of Nos. 18, 20, 22, and 24, Seldon-road, into the street. The catastrophe fortunately did not result in personal injury.

Royal Academy: Lectures in Architecture.—These lectures will be delivered, in accordance with our previous notice, on Thursday, the 30th inst., and the five succeeding Thursdays, at eight p.m. We may usefully repeat what we have before said, that admission for those who are not students of the Academy can be obtained by written application to the Professor of Architecture at the Royal Academy.

Failures.—According to *Kemp's Mercantile Gazette*, the failures in 1878 were 13,630 in number, or 2,383 more than in 1877. The number in 1877 was larger than in 1876; but, inasmuch as the failures in 1868 were 15,860 in number and in 1869 16,518, things have been worse than they are now.

The late Mr. F. P. Cockerell.—The will, dated March 13, 1873, of Mr. Frederick Pepys Cockerell, late of 18, Manchester-square, architect, who died on November 4th, 1878, at 66, Rue François, Paris, was proved on the 7th ult. by Mrs. Mary Mulock Cockerell, the widow, the sole executrix, the personalty being sworn under 14,000*l.*

Fire at Messrs. Tylor & Sons' Works.—We regret to hear that a large portion of the building occupied by Messrs. Tylor & Sons, the well-known manufacturers of water-fittings, in Warwick-lane, has been burned down. A portion of the building destroyed formed part of the old College of Physicians, and included the celebrated dome. The business of the firm is carried on as usual.

Tobermory, N.B.—On the 14th inst. a new Free Church was opened here. It has been erected from designs prepared by Mr. John C. Hay, Edinburgh, the style adopted being the Early English. It consists of a ground-floor and gallery at one end, access to which is gained by staircases right and left of the vestibule, the right-hand entrance being carried up as a tower finishing with a spire. The church is seated for 500 persons. The cost of the building has been about 3,000*l.*

TENDERS

For erection of St. Mark's Church, Hanwell, Middlesex. Mr. William White, architect. Quantities supplied:—

Grimwood & Son	£3,026 0 0
Dove Bros.	2,995 0 0
Lathey Bros.	2,818 0 0
Gregory	2,780 0 0

For works required in diverting sewage south-west of Hampstead parish. Mr. C. Lowe, surveyor:—

Meston	£3,920 0 0
Wall	3,830 0 0
Nowell	3,660 0 0
Killingback	3,637 0 0
George	3,631 0 0
Crockett	3,612 0 0
Watts (accepted)	3,497 0 0

For the erection of No. 8, Blenheim-street, New Bond-street, London. Messrs. Tunley & Boyle, architects. Quantities supplied:—

Merritt & Ashby	£1,700 0 0
Longmire & Burge	1,623 0 0
Crockett	1,593 0 0
Macey & Son	1,503 0 0
Manley	1,497 0 0
Cowland Bros.	1,493 0 0
Outhwaite & Son	1,380 0 0
Sabey & Son	1,350 0 0
Brealey	1,300 0 0

For the erection of chapels (under one roof), lodge, entrance-gates, and wing fencing, at St. Mary Extra Cemetery, Southampton. Mr. W. H. Mitchell, architect. Quantities supplied:—

	Iron gates and fencing.	Oak gates and fencing.
Wyeth	£1,9.0 0 0	£1,850 0 0
Bailey & Son	1,845 0 0	1,787 0 0
Crook	1,478 0 0	1,421 0 0
Rowland	1,402 0 0	1,355 0 0
Stevens & Son	1,348 0 0	1,296 0 0
Chapman (accepted)	1,342 0 0	1,295 0 0

For forming and gravelling roads and paths, laying drain to entrance, and supplying and fixing posts and wire fencing, at St. Mary Extra Cemetery, Southampton:—

Sheppard	£195 10 0
Richards	157 10 0
Batten	120 0 0
Buth (accepted)	94 16 9

For alterations at the Sultan, Picton-street, Camberwell, for Messrs. Hanbury & Co. Mr. E. Brown, architect:—

Little	£470 0 0
Marr	356 0 0
Salt (accepted)	350 0 0

For reinstating No. 1, Hemsworth-street, Hoxton, for Mr. G. Smith. Mr. E. Brown, architect:—

Linzell (accepted)	£297 0 0

For alterations at the Queen's Hotel, Victoria Park, for Mr. A. Angliss. Mr. E. Brown, architect:—

Cocks	£428 0 0
Salt	396 0 0
Hughes (accepted)	337 0 0

For alterations at the Queen Anne, Vauxhall-walk, Lambeth, for Messrs. Hanbury & Co. Mr. E. Brown, architect:—

Marr	£278 0 0
Salt (accepted)	270 0 0
Hearle	265 0 0

For new cottages, Hatter's Farm, Wycombe. Mr. Arthur Vernon, architect:—

Taylor & Grist	£399 10 0
Hunt	397 17 6
Harris	373 3 0
Gibson	340 19 0
Wheeler (accepted)	320 0 0

For laying cast-iron sewer, &c., for the Sevenoaks Local Board:—

Chandler & Sons (accepted).

For two houses at Kenley, for Mr. James Hall. Mr. J. S. Quilter, architect:—

Roberts	£4,659 0 0
Duncan	4,549 0 0
Jarrett	4,350 0 0
Bowyer	4,300 0 0
Lathey	4,276 0 0
Saker	4,100 0 0
Thomson	3,985 0 0
Battley	3,938 0 0
Hobbs	3,200 0 0

For counter and cabinet at the Hare and Hounds tavern, Hampstead. Mr. Ashby, architect:—

Trent Bros.	£397 14 11
Everett & Son	345 7 0
Hill & Son (accepted)	329 0 0

For completing two houses in Clapham Park, for Mr. J. L. Hadley. Messrs. Brown & Goldring, architects:—

Somerford & Sons	£385 0 0
Smith & Scarborough (accepted)	320 0 0

For two houses and shops, at Upper Clapton. Mr. H. H. Bridgman, architect. Quantities by Mr. W. Barnett:—

Crabb	£1,889	0	0
Boyce	1,813	0	0
Shurmur	1,674	0	0
Kirk & Randall	1,648	0	0
Scrivener	1,633	0	0
Hunt	1,602	0	0
Barnes	1,584	6	10
Staines & Son	1,584	0	0
Somerville & Hill	1,046	0	0

For chapels, lodge, mortuary, and boundary-walls, at the New Cemetery, Isleworth. Mr. Rovedino, architect. Quantities supplied:—

Hobern	£8,500	0	0
Harris & Bonell	7,290	0	0
Marriott	6,613	0	0
Hiscock	6,399	0	0
Taylor	6,133	0	0
Stephenson	5,887	0	0
Beauchamp	5,767	0	0
Parker & Evans	5,670	0	0
Beasley	5,621	0	0
Dorey (accepted)	5,294	0	0

For the erection of a mistress's residence, and additions to school, for the School Board for Darenth. Mr. Wm. Eve, architect:—

Blake	£743	0	0
Page	670	0	0
Waller	656	0	0
Hill	590	0	0
Gumbrell*	487	0	0

* Accepted, subject to approval of the Education Department.

For stabling, Bramber-road, Fulham, for the London General Omnibus Company. Mr. A. Tosh, architect. Quantities supplied by Mr. A. J. Bolton:—

Grant	£1,938	14	0
Crabb	1,749	0	0
Niblett	1,739	0	0
Perkins	1,723	0	0
Rudkin Bros.	1,715	0	0
Hobern	1,700	0	0
Gould & Brand	1,695	0	0
Hatton & Co.	1,690	0	0
Priddle	1,673	0	0
Woolveridge Bros.	1,633	0	0
Scott	1,615	0	0
Aitchison & Walker	1,608	0	0
Parker & Evans	1,585	0	0
Beale	1,578	0	0
Wise	1,567	0	0
Foster (accepted)	1,459	0	0

For new billiard-room, and alterations to house, Winslade, Exeter, for Mr. Joshua Dixon. Mr. W. T. Sams, architect. Messrs. J. & A. E. Bull, surveyors:—

Colls & Sons	£3,330	0	0
Bowden & Dorrell	3,058	0	0
McManus	2,934	0	0
Heselgrave	2,860	0	0
Luscombe & Son	2,825	0	0

For alterations to No. 133, New Bond-street, for Messrs. White & Campbell. Mr. W. T. Sams, architect. Messrs. J. & A. E. Bull, surveyors:—

Bywaters (accepted)	£450	0	0

For rebuilding two shops, and alterations to the Royal Standard, White-street, Borough, for Mr. Freeman. Messrs. J. & A. E. Bull, surveyors:—

Croaker (accepted)	£2,732	0	0

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"*Herod's Temple.*"—We have received from Lieutenant Conder a reply to Mr. Fergusson's statement at the Institute of Architects, and will print it in our next issue.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

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